Rate Constants for Reactions of Peroxyl Radicals in Fluid Solutions

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Absolute rate constants for reactions of alkylperoxyl and substituted alkylperoxyl radicals with inorganic and organic compounds in aqueous and non-aqueous fluid solutions have been compiled. The radicals have been generated by radiolysis or photolysis and their rate constants were determined generally by kinetic spectrophotometry or esr. Rate constants are included also for formation of peroxyl radicals by reaction of alkyl radicals with oxygen and for decay of peroxyl radicals by radical-radical reactions.

Key words: alkyl radicals; alkylperoxyl radicals; aqueous solution; chemical kinetics; oxygen; oxygen radicals; peroxyl radicals; photolysis; radiolysis; rate constants.

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1. Introduction

Peroxyl radicals, ROO·, are important reactive intermediates formed in the oxidation of organic and biological materials. They propagate chain reactions and may cause detrimental effects in biological systems. Because of their importance in biological systems, in atmospheric reactions, and in industry, they have been the topic of numerous investigations. Earlier studies have been discussed in several reviews[1] and the kinetic results were summarized in a sizable compilation.[2] This compilation includes a vast number of relative rate constants determined from studies of the autoxidation of hydrocarbons, but only a limited number of absolute rate constants mea-

sured by direct time resolved techniques. Since the publication of the above reviews and compilation many direct measurements of absolute rate constants for reactions of peroxyl radicals in solution have been reported. In addition, a number of indirect determinations have been carried out with fast kinetic techniques and with reference reactions where absolute rate constants have been accurately determined. The present compilation is intended to evaluate the available rate constants and to present them in a concise and readily accessible form. Rate constants derived from autoxidation studies are omitted since their values depend on the assumed mechanism and rate of termination; most of these are found in the previous compilation.[2] A brief description of the methods of production of peroxyl radicals and of determination of their rate constants, as well as the general patterns of peroxyl radical reactions, are given below.

1.1. Production of Peroxyl Radicals

Peroxyl radicals generally are produced by reaction of O_2 with alkyl radicals. Since alkyl radicals can be produced via many different reactions, we will discuss first procedures by which different types of alkyl radicals can be produced.

1.1.1. Production of Alkyl Radicals by Radiolysis

Substituted alkyl radicals are produced in irradiated solutions by reaction of primary radiolytic species with the solvent or with solutes. In aqueous solutions the radicals are generated by the reactions of e_{aq}^- or ·OH radicals with various organic compounds. If the ·OH radical is to be used, the solutions typically contain N_2O to convert the e_{aq}^- into ·OH, thus increasing the yield of the desired alkyl radical and reducing possible complications arising from other reactions of the electron.

$$H_2O \rightsquigarrow e_{aq}^- + H\cdot + \cdot OH + H_2 + H_2O_2 \quad (1)$$

$$e_{aq}^- + N_2O \rightarrow N_2 + OH^- + \cdot OH \quad (2)$$

$$\cdot OH + RH \rightarrow H_2O + R\cdot \quad (3)$$

If the e_{aq}^- is to be used to produce the desired alkyl radical, the ·OH radical cannot simply be converted to the hydrated electron, but often can be converted to a reducing radical capable of producing more of the desired alkyl radical. Otherwise, secondary products arising from the ·OH must be taken into account in the kinetic analysis.

(a) Many alkyl radicals have been formed by hydrogen abstraction from the solvent or a solute by primary or secondary radiolytic products. This can result in a mixture of several alkyl radicals, depending upon the selectivity of the reactant radical. The ·OH radical is very non-selective and is used primarily to produce radicals from simple precursors, for example methanol, acetone, or acetonitrile, where essentially all of the alkyl radicals will be identical. For 2-propanol, which is slightly more complex, 86% of the alkyl radicals will be secondary while 13% will be primary. When ·OH is allowed to react with precursors containing aromatic moieties, the situation may be even more complex, with the formation of OH adduct radicals along with radicals formed by abstraction from side chains. Rate constants for a large number of hydroxyl radical reactions are summarized in a recent compilation.[3]

(b) Many simple alkyl radicals can be formed cleanly by the reaction of ·OH with alkyl sulfoxides via an addition/fragmentation mechanism.[4]

$$\cdot OH + R_2SO \rightarrow R_2\dot{S}O(OH) \rightarrow RSO_2H + R\cdot \quad (4)$$

Since the rate constants for reaction of ·OH with the sulfoxides are $>10^9$ L mol^{-1} s^{-1} and the lifetime of the OH-adducts are <200 ns, in 0.01 mol L^{-1} sulfoxide solutions the radicals R· are produced in <1 μs after the pulse.

(c) Alkyl radicals are also produced by reaction of e_{aq}^- with halogenated organic compounds, leading to reductive elimination of a halide ion. The ·OH radicals can be removed by scavenging them with 2-PrOH, Eq. (6), or with formate ions, Eq. (7).

$$e_{aq}^- + RX \rightarrow X^- + R\cdot \quad (5)$$

$$\cdot OH + (CH_3)_2CHOH \rightarrow H_2O + (CH_3)_2\dot{C}OH \quad (6)$$

$$\cdot OH + HCO_2^- \rightarrow H_2O + CO_2\cdot^- \quad (7)$$

The radical from 2-PrOH will reduce some halogenated compounds (such as CCl_4 or CH_3I) to produce more of the desired radical.[5]

$$(CH_3)_2\dot{C}OH + RX \rightarrow (CH_3)_2CO + H^+ + X^- + R\cdot \quad (8)$$

Many halogenated compounds, however, do not react rapidly with $(CH_3)_2\dot{C}OH$, which will instead react with O_2 to produce a peroxyl radical.[6,7] This may need to be taken into account in the subsequent kinetic analysis.

The $CO_2\cdot^-$ radical formed by reaction (7) reacts rapidly with O_2 to yield $O_2\cdot^-$ and CO_2.[8] The radical $O_2\cdot^-$ is a very weak oxidant[9] and in most cases does not interfere with the oxidation of organic reductants by the peroxyl radicals. Further details on the reactions involved in the preparation of the various substituted alkyl radicals have been given elsewhere.[5,10,11,12]

(d) Alkyl radicals have also been produced by reaction of e_{aq}^- with alkylammonium derivatives, a reaction that proceeds by reductive elimination of ammonia.[13]

$$e_{aq}^- + C_6H_5CH_2NH_3^+ \rightarrow NH_3 + C_6H_5CH_2\cdot \quad (9)$$

Elimination of ammonia occurs only when the amino group is protonated and the α-carbon bears an electron withdrawing group such as carbonyl or phenyl. However, the process is not always quantitative, benzylammonium undergoes deamination corresponding to 70% of the e_{aq}^- but diphenylmethylammonium deaminates to 95%, the rest of the hydrated electron reactions occur via ring addition and protonation to give an H-adduct.[13] The H-adducts and OH-adducts may also react with O_2 to form peroxyl radicals, whose contribution to the observed oxidation processes may have to be taken into account.

1.1.2. Photolytic Production of Alkyl Radicals

Photolytic methods for production of the alkyl radical precursors of peroxyl radicals have been extensively employed, particularly in the studies of the self-reactions of peroxyl radicals and in some of the slower reactions of peroxyl radicals with other solutes. Techniques include the photolysis of azo compounds,[14] ketones,[15] and, less frequently, the photolysis of compounds containing metal-carbon bonds.[16] Photodecomposition of azo compounds results in formation of two alkyl radicals and, if the azo compound is symmetric, the radicals are identical.

$$R{-}N{=}N{-}R \xrightarrow{h\nu} 2\,R\cdot + N_2 \qquad (10)$$

On the other hand, photolysis of ketones yields an alkyl and an acyl radical, both of which may react with O_2 to form peroxyl radicals. As a result the kinetic measurements may be for concurrent reactions with different rate constants.

$$R{-}CO{-}R \xrightarrow{h\nu} R\cdot + \cdot CO{-}R \qquad (11)$$

A common photolytic technique is to generate a reactive intermediate which can abstract a hydrogen atom from a solute or the solvent to produce the desired alkyl radical. The photolysis of H_2O_2 has been used to produce ·OH radicals, but it is more common to employ photolysis to produce more selective reactants. For example, the photolysis of di-*tert*-butyl peroxide (DTBP) is employed to produce *tert*-butoxyl radicals, which are then used to react with the solvent.

$$(tert\text{-}BuO)_2 \xrightarrow{h\nu} tert\text{-}BuO\cdot \qquad (12)$$

$$tert\text{-}BuO\cdot + RH \rightarrow tert\text{-}BuOH + R\cdot \qquad (13)$$

Radicals such as *tert*-butoxyl are far more selective than the hydroxyl radical, allowing greater control over the specific alkyl radical produced and the subsequent peroxyl radical. Generally, this greater selectivity means that, where possible, tertiary alkylperoxyl will predominate over secondary which, in turn, will predominate over primary. Further, this radical does not add to the aromatic ring, reacting only by abstraction from the alkyl substitutent.

1.1.3. Reaction of Alkyl Radicals with Oxygen

Alkyl radicals react with O_2 rapidly to form peroxyl radicals.

$$R\cdot + O_2 \rightarrow ROO\cdot \qquad (14)$$

The rate constants for these reactions are generally of the order of 10^9 L mol^{-1} s^{-1} (Table 3). With rate constants k_{14} of 2×10^9 L mol^{-1} s^{-1} and $[O_2]$ 3×10^{-4} mol L^{-1} (corresponding to N_2O/O_2 or Ar/O_2 4:1 mixtures), formation of ROO· by reaction (14) is complete within $\leqslant 10$ μs, a period much shorter in most cases than that used for observation of subsequent reactions of ROO· (see below). Rate constants for the reactions of alkyl radicals with oxygen have also been measured in the gas phase.[17] The rate constants range from 1.3×10^9 for methyl radicals to 9×10^9 L mol^{-1} s^{-1} for isopropyl radicals.

1.2. Reactions of Peroxyl Radicals

Peroxyl radicals are detected by their optical absorption or esr spectra. Peroxyl radicals exhibit weak absorptions in the UV, generally with a peak at or below 250 nm, which have been utilized to measure the rates of second-order decay of these radicals. These absorptions, however, do not permit accurate monitoring of the reactions of peroxyl radicals with substrates, particularly when the substrates absorb in the UV. Therefore, rates of reaction of peroxyl radicals with inorganic and organic compounds were determined in most cases by following the decay of the esr signal of peroxyl radicals or the buildup of optical absorption of the product radical. When the product radical exhibits no intense absorption at $\lambda > 250$ nm, as in the case of fatty acids, the rate constants were determined by competition kinetics using compounds such as ABTS or porphyrins as reference reactants.

1.2.1. Radical-Radical Reactions

The derivation of an absolute rate constant for the self-reaction of peroxyl radicals requires the determination of the absolute concentration of the radicals corresponding to the signal being measured. Radical concentrations have been followed in one of three ways: by optical absorption, electron spin resonance (esr), or by the change in conductivity.

When optical absorption is used, the molar absorptivity of the radical at the wavelength used is needed. In most cases, this quantity was not determined, but taken from the literature, often from gas-phase work. Table 1 summarizes most of the reported values of the molar absorptivity of peroxyl radicals. There is obviously not complete consistence in the values, but where the determinations were fairly direct, the absorptivity at the wavelength of maximum absorption for the smaller radicals appears to be about 1000 ± 200 L mol^{-1} cm^{-1}.

Where there is no other direct information on the absorptivity, we have used this value to derive the second-order rate constant.

The determination of radical concentration by esr is much more straightforward, since the magnitude of the signal is proportional to the number of free spins, but independent of the radical type. The radical concentration, therefore, can be obtained by comparison of the peak area (obtained by double-integrating the first-derivative signal) with the area obtained from a known concentration of a stable free radical.

Rate constants for self-reactions of peroxyl radicals also have been obtained by following the change in conductivity of the solution after the generation of the radicals. In this case, information on the mechanism of the reaction must first be obtained, specifically the yields of products which influence the conductivity. Typically, the conductivity change arises from the generation or consumption of protons in the reaction, either directly or indirectly. For example, if O_2^- is eliminated from a product of the reaction, and the experiment is carried out at low pH, O_2^- will protonate to form HO_2, decreasing the conductivity by a known amount.

Rate measurements on the self-reactions of peroxyl radicals derived from secondary and tertiary alkyl radicals have been carried out over a range of experimental conditions, particularly over a wide range of temperature. The rate constants for self-reactions of primary alkylperoxyl radicals have been carried out only at room temperature and, typically, only in aqueous solutions. This is due to the large difference in reactivity between these classes of radicals. Primary alkylperoxyl radicals react by self-reaction very rapidly, near the collision rate; secondary radicals react much more slowly, and tertiary radicals react very slowly. Therefore, rapid kinetic techniques, such as pulse radiolysis or flash photolysis, are required for the study of primary radicals while slower kinetic techniques, such as interrupted photolysis, can be used for secondary and tertiary radicals.

At low temperatures (<200 K), secondary and tertiary peroxyl radicals exist in equilibrium with their dimers, the tetroxides. This leads to a much greater apparent temperature dependence in the rate constant at these low temperatures. As the temperature is raised, disproportionation becomes more important. For example, for the 2-propylperoxyl radical:

$$2(CH_3)_2CHOO\cdot \rightarrow (CH_3)_2CHOH + (CH_3)_2CO + O_2. \quad (15)$$

As the temperature is raised further, formation of alkoxyl radicals can become important,

$$2(CH_3)_2CHOO\cdot \rightarrow 2(CH_3)_2CHO\cdot + O_2 \quad (16)$$

leading to a further increase in the measured temperature dependence.

Rate constants for the self-reactions of primary and secondary peroxyl radicals have been measured in the gas-phase.[17] At room temperature their values are similar to those observed for primary and small secondary peroxyl radicals in the liquid phase. The most interesting feature of the observations is the temperature dependence. For ethylperoxyl radicals the temperature dependence is small, with $E_a = 910$ J mol^{-1}; for methylperoxyl radicals the temperature dependence is negative, with $E_a = -1830$ J mol^{-1}. For 2-propylperoxyl radicals, the temperature dependence is somewhat stronger than that reported for the liquid phase, with $E_a = 12$ kJ mol^{-1} for reaction (15) and 21.5 kJ mol^{-1} for reaction (16).

1.2.2. Reactions with Molecules

Rate constants for reaction of peroxyl radicals with other molecules are determined by following the decay of the optical or esr signal of the peroxyl radicals but more often by following the formation of the product absorption signal. Generally, reactions are monitored under conditions of excess substrate so that the decay follows a first-order rate law. The second-order rate constants are derived from linear plots of the observed first-order rates, k_{obs}, as a function of substrate concentration. When k_{obs} is very high, the rate of formation of the peroxyl radical may limit the observed rate. Under these conditions the plot of k_{obs} vs. concentration will curve and approach a plateau, but the second order rate constant can be derived from the initial slope.

Due to the complexity of many of these chemical systems, it is very difficult to establish with confidence the accuracy of the reported rate constants. The precision of the numbers depends basically on the number of measurements taken and the range of concentrations employed. If at least four concentrations are used, varying by an overall factor of at least 4, and the measurement at each concentration repeated several times, and if the above linear plot has a relatively small intercept, the second-order rate constants probably have a precision of ± 10%. Not all measurements reported have been carried out with this level of precision but most are better than ± 25%. The level of precision is not given in the tables, but when the rate constants were only approximations the values are denoted as such.

Peroxyl radicals react with inorganic and organic compounds predominantly by electron transfer, hydrogen abstraction, or addition. Only a few absolute rate constants have been reported for hydrogen abstraction and addition reactions, and these were generally measured by competition kinetics rather than by direct measurements. Peroxyl radicals abstract H only from weak C—H bonds because the ROO—H bond dissociation energy is 380 kJ mol^{-1},[18] higher than that of allylic or benzylic C—H bonds but lower than that of primary and secondary C—H bonds. The abstraction is relatively slow and, therefore, measurement of rate constants is hampered by the faster radical-radical decay processes.

By far the most studied reactions of peroxyl radicals are those involving electron transfer. Typical of the elec-

tron transfer reactions is the oxidation of ascorbate ions[10–12]

$$ROO\cdot + AH^- \rightarrow ROOH + A\cdot^- \quad (17)$$

and of TMPD (*N*,*N*,*N*′,*N*′-tetramethyl-*p*-phenylenediamine).[19,20]

$$ROO\cdot + H_2O + TMPD \rightarrow ROOH + TMPD\cdot^+ + OH^- \quad (18)$$

Ascorbate is known to be oxidized very rapidly (k near 10^9 L mol^{-1} s^{-1}) by the polyhalogenated alkylperoxyl radicals but much more slowly ($k = 2 \times 10^6$ L mol^{-1} s^{-1}) by methylperoxyl.[10–12] However, both the fast and the slow reactions lead to the same product, the ascorbate radical. The very large increase in rate constants upon substitution with halogens suggests that electron withdrawing substituents have a significant effect on the reactivity of peroxyl radicals. Correlation of rate constants for reaction of ascorbate ions and TMPD with thirty different substituted methylperoxyl radicals[21] with the polar substituent constants σ^*[22] shows that the reactivity of peroxyl radicals increases systematically with increasing electron-withdrawing power of their substituents, evidence for an electron-transfer mechanism.

Rate constants for the reactions of peroxyl radicals with ascorbate, Trolox (6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate), and TMPD also have been determined in different solvents[23] and were found generally to increase with increasing water content in the solvent mixture and with increasing solvent polarity. The rate constants were found to correlate well with a two-parameter equation which includes the dielectric constant of the solvent and the coordinate covalency parameter, a measure of the proton-transfer basicity of the solvent. Kinetic isotope effects in H_2O/D_2O of about 2 and activation entropies of about -10 J K^{-1} mol^{-1} for reduction of ROO· by the organic reductants indicate that electron transfer to the peroxyl radical is concerted with transfer of proton from the solvent to the incipient hydroperoxide anion.

Oxidation of metalloporphyrins by peroxyl radicals also takes place by electron transfer. For these complexes it was concluded that the mechanism is not an outer sphere electron transfer but rather involves an intermediate binding of the peroxyl radical to the metal center of the metalloporphyrin.[24]

Because of the strong solvent effect discussed above one should be extremely careful in extrapolating results from aqueous or alcoholic solutions to the biological system, since the exact nature of the microenvironment may change the rate constant by as much as two orders of magnitude. Also, when comparing the reactivities of several compounds or radicals it is necessary to take into account the solvent effect. Table 2 presents a comparison of the reactivities of four compounds with the various peroxyl radicals. The values of the rate constants in this Table are taken from Tables 6 and 7 and for each case they are for the measurement in aqueous or as close to aqueous solution as was available. This Table can serve for comparing the reactivities of the various radicals in electron transfer reactions.

2. Arrangement of Tables 3–7

Table 3 contains rate constants of reactions for formation of peroxyl radicals by reaction of alkyl radicals with O_2. Table 4 contains rate data for radicals which undergo first-order decomposition or hydrolysis in solution. Table 5 contains rate constants for second-order radical-radical reactions. Separate tables are provided for reactions of unsubstituted (Table 6) and substituted (Table 7) alkylperoxyl radicals with various substrates. The order of entries in Table 3 for the formation of peroxyl radicals, is the same as the arrangement in Tables 4–7 for the reactions of peroxyl radicals. Unsubstituted alkylperoxyl radicals ROO·, are given first, arranged by increasing number of carbons in R. Each radical has a separate entry number in each table, e.g. 6.1 for Methylperoxyl in Table 6. For each radical the reactions of inorganic substrates are given first, in alphabetical order of the symbol for the main element, and numbered 6.1.1, etc. Organic substrates follow in alphabetical order by name. Systematic names are used in the table for the substrates, unless the reactant is better known by a common name and has a complex structure. Alternate names are given in the chemical name index.

Table 7 includes reactions of substituted alkylperoxyl radicals with various substrates. Oxygen-, nitrogen- and phosphorus-substituted alkylperoxyl radicals are listed first followed by haloalkyl radicals in the following order: F-containing (by increasing numbers of F), Cl-containing, and Cl + F, (by increasing numbers of Cl), Br-containing, and I-containing. Peroxyl radicals derived from compounds of biological importance, e.g. lipids and nucleoside bases, are grouped at the end. The arrangement for each radical's reactions with inorganic and organic substrates is the same as in Table 6.

Section 4 contains a list of radicals in the order of appearance in the tables. The molecular formula index (Sec. 8.1) and chemical name index (Sec. 8.2) include all of the reactant radicals and can be consulted for the entry numbers in Tables 3–7 where reactions of the radicals appear. The indexes also include all of the substrates and the entry numbers in the tables where reactions of the substrates with various radicals appear. The indexes have been generated from the registry file at the Radiation Chemistry Data Center. The chemical name index may contain alternate names to those listed in the tables (systematic names and synonyms); inverted names are also included in the index whenever they were present in the registry file. A molecular formula index is also provided as an aid to locating particular reactants.

The products of the reactions are included when they are known reasonably well or when they have been discussed in the paper reporting the data. In cases where rate constants are given for a series of pH values it

should be understood that a mixture of ionic forms of the substrate (and of the radical and the products) may be present.

For the values of k_{obs} the "temperature" column contains the value in Kelvins (K) or RT (room temperature). The temperatures 200 K or 298 K are given in brackets following values of k which have been calculated from log A and E_a in Tables 5 and 6; in those cases the temperature range of the measurements is given in the comments. When the temperature is not given in the table the measurement was stated or presumed to be carried out at room temperature. In the "solvent" column the main solvent is given first followed by other components amounting to 10% or more of the solvent mixture.

The "method" column contains symbols such as p.r. (pulse radiolysis), and f.p. (flash photolysis), which indicate the method of generation of the radical. The "comment" column briefly describes the means of following the reaction, e.g. p.b.k. indicates product buildup kinetics with optical detection. Other means of detection are given, along with concentrations of solutes, the source of the radical, and other details about the determination. The rate constants for the reference reactions are given for the few rate constants which have been derived by competition. Abbreviations and symbols are identified in Sec. 3.

References to the tables, in Sec. 7 which follows the tables, are listed by serial number assigned by the Radiation Chemistry Data Center and included in the RCDC Bibliographic Data Base.

3. List of Abbreviations and Symbols

A	frequency factor
abs.	absorption
ABTS	2,2′-azinobis(3-ethylbenzothiazoline-6-sulfonate)
AH^-	ascorbate ion
tert-BuOH	*tert*-butyl alcohol (2-methyl-2-propanol)
calcd.	calculated
c.k.	competition kinetics
concn.	concentration
condy.	conductivity
contg.	containing
CZ	chlorpromazine
detd.	determined
d.k.	decay kinetics
DPPH	diphenylpicrylhydrazyl
DTBP	di-*tert*-butyl peroxide
ϵ	extinction coefficient (molar absorptivity)
E_a	activation energy
EtOH	ethanol
esr	electron spin resonance
f.p.	flash photolysis
formn.	formation
G	radiation yield (molecules per 100 eV)
J	joules (4.184 J = 1 cal)
K	equilibrium constant
k	rate constant
k_f	specific rate of the forward reaction
k_r	specific rate of the reverse reaction
meas.	measured
MeOH	methanol
obs.	observed
o.d.	optical density
opt.	optical
Ph	phenyl
p.b.k.	product buildup kinetics
phot.	photolysis
pK_a	negative logarithm of the acid dissociation constant
p.r.	pulse radiolysis
prod.	product
PrOH	propanol
redn.	reduction
rel.	relative
satd.	saturated
s.f.	stopped-flow
soln.	solution
TMPD	*N*,*N*,*N*′,*N*′-tetramethyl-*p*-phenylenediamine

4. List of Peroxyl Radicals

Alkylperoxyl

Methylperoxyl
Ethylperoxyl
2-Propylperoxyl
Butylperoxyl
sec-Butylperoxyl
tert-Butylperoxyl
Pentylperoxyl
1,1-Dimethylpropylperoxyl
2,2-Dimethylpropylperoxyl
Peroxyl radical from cyclopentene
Cyclopentylperoxyl
Hexylperoxyl
1,1-Dimethylbutylperoxyl
Cyclohexenylperoxyl
Cyclohexylperoxyl
1-Methylcyclohexylperoxyl
Methylcyclohexylperoxyl
Heptylperoxyl
1,1,2,2-Tetramethylpropylperoxyl
Cycloheptylperoxyl
Octylperoxyl
Cyclooctylperoxyl
Peroxyl radical from octene
Nonylperoxyl
Decylperoxyl
Dodecylperoxyl
Cyclododecylperoxyl
Tridecylperoxyl

2,4,6,8-Tetramethylnonylperoxyl
2,4,6,8-Tetramethylnonenylperoxyl
Hexadecylperoxyl
Peroxyl radicals of polypropylene

Substituted alkylperoxyl

Allylperoxyl
Benzylperoxyl
4-Nitrobenzylperoxyl
Diphenylmethylperoxyl
Hydroxycyclohexadienylperoxyl
Dihydroxycyclohexadienylperoxyl
Hydroxymethylperoxyl
1-Hydroxyethylperoxyl
2-Hydroxyethylperoxyl
1-Hydroxy-1-methylethylperoxyl
2-Hydroxy-2,2-dimethylethylperoxyl
Hydroxycyclopentylperoxyl
Hydroxycyclohexylperoxyl
Hydroxycyclododecylperoxyl
1-Hydroxy-1,7,7-trimethylbicyclo[2.2.1]heptylperoxyl
Dihydroxymethylperoxyl
1,2-Dihydroxyethylperoxyl
1,2,3-Trihydroxypropylperoxyl
1,2,3,4-Tetrahydroxybutylperoxyl
1,2,3,4,5-Pentahydroxypentylperoxyl
Peroxyl radicals from glucitol
Peroxyl radicals from inositol
Peroxyl radicals from glucose
Peroxyl radicals from methyl α-D-blucopyranoside
1,3-Dihydroxycyclopentylperoxyl
1,2-Dihydroxycyclohexylperoxyl
1,3-Dihydroxycyclohexylperoxyl
1,4-Dihydroxycyclohexylperoxyl
1-Ethoxyethylperoxyl
Isopropoxy(dimethyl)methylperoxyl
1,1-Dimethoxyethylperoxyl
Tetrahydro-2-furanylperoxyl
2,5-Dioxacyclohexylperoxyl
2,4,6-Trioxacyclohexylperoxyl
1,3,5-Trimethyl-2,4,6-trioxacyclohexylperoxyl
Tri(methoxy)methoxymethylperoxyl
Acetylperoxyl
2-Oxopropylperoxyl
Pivaloylperoxyl
Peroxyl radicals from 2,6,8-trimethylnonan-4-one
Carboxymethylperoxyl, anion
Peroxyl radicals from octanoic acid
Acetoxymethylperoxyl
1-Acetoxyethylperoxyl
1-Acetoxypropylperoxyl
1-Acetoxy-1-methylethylperoxyl
Acetoxybutylperoxyl
Acetoxypentylperoxyl
Acetoxy(phenyl)methylperoxyl
(Ethoxycarbonyl)valeratoethylperoxyl
1,2-Diacetoxyethylperoxyl
1,3-Diacetoxy-2,2-dimethylpropylperoxyl
1,3-Dipropanoato-2,2-dimethylpropylperoxyl
1,2,2-Triacetoxy-2-ethylbutylperoxyl
1,1,1-Triacetoxymethyl-2-acetoxyethylperoxyl
1,1,1-Tri(propionatomethyl)-2-propionatoethylperoxyl
1,1,1-Tri(valeratomethyl)-2-valeratoethylperoxyl
1,1,1-Tribenzoatomethyl-2-benzoatoethylperoxyl
Cyanomethylperoxyl
Amino(carboxy)methylperoxyl
Trimethylammoniomethylperoxyl
Dimethylphosphatomethylperoxyl

Haloalkylperoxyl

Fluoromethylperoxyl
Carboxy(difluoro)methylperoxyl, anion
Trifluoromethylperoxyl
1,2,2-Trifluoro-2-(difluoromethoxy)ethylperoxyl
2,2,2-Trifluoro-1-difluoromethoxyethylperoxyl
Perfluoropolyetherperoxyl from photooxid. of C_2F_4
Perfluoropolyetherperoxyl from photooxid. of C_3F_6
Chloromethylperoxyl
1-Chloroethylperoxyl
2-Chloroethylperoxyl
Carboxy(chloro)methylperoxyl, anion
Chlorodifluoromethylperoxyl
1-Chloro-2,2,2-trifluoroethylperoxyl
2-Chloro-1,1,2,2-tetrafluoroethylperoxyl
1-Chloro-2,2-difluoro-2-methoxyethylperoxyl
Dichloromethylperoxyl
1,1-Dichloroethylperoxyl
1,2-Dichloroethylperoxyl
Dichloro(cyano)methylperoxyl
Carboxy(dichloro)methylperoxyl, anion
Dichlorofluoromethylperoxyl
1,2-Dichloro-1,2,2-trifluoroethylperoxyl
Trichloromethylperoxyl
1,2,2-Trichloroethylperoxyl
Pentachloroethylperoxyl
Bromomethylperoxyl
Dibromomethylperoxyl
Tribromomethylperoxyl
Iodomethylperoxyl

Peroxyl radicals from biological-type molecules

Peroxyl radicals from linoleate-OH adduct
Peroxyl radicals from linoleate
13-Peroxyl radical from linoleate
Peroxyl radicals from linolenate
13-Peroxyl radical from linolenate
Peroxyl radicals from oleic acid
3β-3-Hydroxycholest-5-en-7-ylperoxyl
3β-3-Hydroxycholestan-7-ylperoxyl
3β-3-Dodecanoyloxycholest-5-en-7-ylperoxyl
3β-3-Dodecanoyloxycholestan-7-ylperoxyl
Peroxyl radical of thymine-H adduct

Peroxyl radical of uracil-H adduct
Peroxyl radical of uracil-OH adduct
6-Peroxyl radical of uracil-5-OH adduct
6-Peroxyl radical of cytosine-5-OH adduct
6-Peroxyl radical of thymine-5-OH adduct
Peroxyl radicals of thymine-OH adduct
Peroxyl radical of thymidine-OH adduct
Peroxyl radical of deoxyguanosine-OH adduct
Peroxyl radical of deoxycytidine-OH adduct
Peroxyl radical of polyuridylic acid-OH adduct
Peroxyl radical of polyadenylic acid-OH adduct
Peroxyl radical of single-stranded DNA-OH adduct
Peroxyl radical of double-stranded DNA-OH adduct

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TABLE 1. Molar absorptivities for peroxyl radicals

Radical	Medium[a,b]	Radical precursor	λ (nm)	ε (L mol^{-1} cm^{-1})	Ref.
Methylperoxyl	aq	Methane	250	1200	751055
	g	Cl_2/CH_4	240	1050	89B901
Ethylperoxyl	aq	Ethane	250	1250	751055
	g	Ethane	250	1020	88A113
			240	1085	
Propylperoxyl	g	Azoalkane/pentane	260	824	82A266
2-Propylperoxyl	g	Azoalkane/pentane	240	1273	82A266
		H_2/propylene	223	1300	86A418
tert-Butylperoxyl	liq	Tridecane/$(CH_3)_3COOH$	290	390	86A525
	g	Azoalkane	250	1040	78A327
Pentylperoxyl	liq	Pentane	290	910	741019
Alkylperoxyl (C_6-C_{16})	liq	Alkane	260	650	80A428
Cyclopentylperoxyl	aq	Cyclopentane	268	1450	741051
	aq	Cyclopentane	270	1100	84A324
Cyclohexylperoxyl	liq	Cyclohexane	255	1900	710136
	liq	Cyclohexane	275	2000	61A003
	liq	Cyclohexane	265	800	80A428
	liq	Cyclohexane	235	330	86A525
			280	645	
	aq	Cyclohexane	260	750	84A324
Hydroxymethylperoxyl	aq	MeOH	248	1070	741099
	aq	MeOH	248	1100	761081
			290	500	
1-Hydroxy-1-methylethylperoxyl	aq	2-PrOH	248	1100	761081
			290	500	
2-Hydroxy-2,2-dimethylethylperoxyl	aq	*tert*-BuOH	~250	1350	79A295
Hydroxycyclohexylperoxyl	liq	Cyclohexanol	246	1600	710136
Hydroxycyclohexadienylperoxyl	aq	Benzene	310	690	761212
1-Hydroxy-1,7,7-trimethyl-bicyclo[2.2.1]heptylperoxyl	aq	Camphor	260	1060	79A191
Isopropoxy(dimethyl)methylperoxyl	aq	Isopropyl ether	240	1000	87G038
2-Oxopropylperoxyl	aq	Acetone	280-300	550	86A285
Carboxymethylperoxyl, anion	aq	Acetate	305	550	761082
			340	360	
	aq	Acetate	290	900	761207
	aq	Acetate	280	730	85A106
Acetoxymethylperoxyl	aq	Methyl acetate	260	1300	78A402
Methoxycarbonylmethylperoxyl	aq	Methyl acetate	260	900	78A402
1-Hydroxy-1-carboxyethylperoxyl	aq	Lactate	240	1000	731052
Chloromethylperoxyl	g	Cl_2/CH_3Cl	250	823	88A323
Acetylperoxyl	g	Cl_2/CH_3CHO	245	970	89A085
2-Chloroethylperoxyl	g	Cl_2/C_2H_4	250	954	88A153
Dichloromethylperoxyl	liq	Chloroform	255	1380	82B130
Trichloromethylperoxyl	aq	2-PrOH/CCl_4	310	400	89A019
Fluoromethylperoxyl	g	Cl_2/CH_3F	240	975	88A323
Thymylperoxyl	aq	Thymine	240	1300	741151
Peroxyl radical of uracil-OH adduct	aq	Uracil	300	280	710256
Peroxyl radical from arachidonate	aq	Arachidonate (pH 3.4)	275	300	82B008
		(pH 10.5)		2900	

[a] aq = aqueous, g = gas, liq = liquid.
[b] In the presence of oxygen.

TABLE 2. Comparison of the rate constants, k (L mol^{-1} s^{-1}), for oxidation of ascorbate ion (AH^-), 2,2'-azinobis(3-ethylbenzothiazoline-6-sulfonate ion (ABTS), chlorpromazine(CZ) and *N,N-N',N'*-tetramethyl-*p*-phenylenediamine (TMPD), with peroxyl radicals in aqueous solution

Radical	AH^-	ABTS	CZ	TMPD
Methylperoxyl	2.0×10^6	$< 10^5$		4.3×10^7
Ethylperoxyl				3.3×10^7
2-Propylperoxyl				9.2×10^6
Butylperoxyl				2.9×10^7
tert-Butylperoxyl				1.1×10^6
Allylperoxyl	1.4×10^6			
Benzylperoxyl	2.5×10^6			
4-Nitrobenzylperoxyl	3.3×10^6			
Diphenylmethylperoxyl	9×10^6			
Hydroxymethylperoxyl	4.7×10^6			7.2×10^7
1-Hydroxy-1-methylethylperoxyl	1.2×10^6			
2-Hydroxy-2,2-dimethylethylperoxyl	2.0×10^6			4.5×10^7
1-Ethoxyethylperoxyl				4.4×10^7
Tetrahydro-2-furanylperoxyl				3.7×10^7
2,5-Dioxacyclohexylperoxyl		5.0×10^6		1.6×10^8
2,4,6-Trioxacyclohexylperoxyl				2.3×10^8
1,3,5-Trimethyl-2,4,6-trioxacyclohexylylperoxyl				1.1×10^8
Tri(methoxy)methoxymethylperoxyl				1.2×10^8
Acetylperoxyl	8.3×10^6	1.8×10^9		1.9×10^9
2-Oxopropylperoxyl	7.5×10^6		$\sim 2 \times 10^6$	6.6×10^7
Carboxymethylperoxyl, anion	2.2×10^6			6.0×10^7
Cyanomethylperoxyl	5.0×10^7		6.8×10^6	2.9×10^8
Trimethylammoniomethylperoxyl	4.0×10^8			
Fluoromethylperoxyl	1.7×10^8			
Trifluoromethylperoxyl	6.8×10^8		1.2×10^9	
1,2,2-Trifluoro-2-(difluoromethoxy)ethylperoxyl	4.8×10^8	5.0×10^8		
2,2,2-Trifluoro-1-(difluoromethoxy)ethylperoxyl	2.7×10^8	1.0×10^8	3.1×10^8	
Chloromethylperoxyl	1.2×10^8	4.4×10^7	2.5×10^7	4.2×10^8
1-Chloroethylperoxyl	9.2×10^7	3.3×10^7	8.9×10^8	
2-Chloroethylperoxyl	5.0×10^6			
Carboxy(chloro)methylperoxyl, anion	5.1×10^7			
1-Chloro-2,2,2-trifluoroethylperoxyl	6.1×10^8	5×10^8	5×10^8	
1-Chloro-2,2-difluoro-2-methoxyethylperoxyl	3.3×10^8	3.4×10^8	4.7×10^8	
Dichloromethylperoxyl	7.0×10^8	6.5×10^8	3.6×10^8	7.4×10^8
1,1-Dichloroethylperoxyl	4.6×10^8	4.3×10^8	7.4×10^8	
1,2-Dichloroethylperoxyl	1.9×10^8	1.1×10^8	1.4×10^8	
Dichloro(cyano)methylperoxyl	1.2×10^8	5.8×10^8	9.1×10^8	
Carboxy(dichloro)methylperoxyl, anion	9.0×10^7			
Dichlorofluoromethylperoxyl			1.2×10^8	
1,2-Dichloro-1,2,2-trifluoroethylperoxyl	6.9×10^8	2.2×10^9	1.8×10^9	
Trichloromethylperoxyl	9.1×10^8	1.9×10^9	1.2×10^9	1.9×10^9
Pentachloroethylperoxyl	$>4 \times 10^7$	4.3×10^8	4.2×10^8	
Bromomethylperoxyl	1.5×10^8			
Tribromomethylperoxyl	2.1×10^8		7.7×10^8	
Iodomethylperoxyl	1.3×10^8			
6-Peroxyl radical of uracil-5-OH adduct				1.4×10^8
6-Peroxyl radical of cytosine-5-OH adduct				1.6×10^8
6-Peroxyl radical of thymine-5-OH adduct				$\sim 1 \times 10^8$
Peroxyl radical of thymidine-OH adduct	2.5×10^7	1.3×10^7		8.3×10^7
Peroxyl radical of deoxycytidine-OH adduct	1.8×10^7	1.2×10^7		6.8×10^7
Peroxyl radical of deoxyguanosine-OH adduct				1.5×10^9

TABLE 3. Rate constants for reactions R· + O_2 → ROO·

No.	Radical/Reaction	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
3.1	**Methyl**						
	·CH_3 + O_2 → CH_3OO·	4.7×10^9	nat.	Water	p.r.	P.b.k. at 260 nm in soln. contg. CH_3Br, O_2 and SCN^-; E_a = 14.6 kJ mol^{-1}.	670041
3.2	**Ethyl**						
	·CH_2CH_3 + O_2 → C_2H_5OO·	2.9×10^9	nat	Water	p.r.	P.b.k. at 270 nm in soln. contg. 6×10^{-5} mol L^{-1} O_2 and ethane.	751055
3.3	***tert*-Butyl**						
	$(CH_3)_3\dot{C}$ + O_2 → $(CH_3)_3COO$·	4.9×10^9		c-C_6H_{12}	f.p.	D.k. at 320 nm in N_2/O_2 satd. soln. contg. di-*tert*-butyl ketone at 300 K.	83A161
3.4	**Cyclopentyl**						
	c-C_5H_9 + O_2 → c-C_5H_9OO·	4.9×10^9	7	Water	p.r.	P.b.k. at 270 nm in N_2O/O_2 satd. soln. contg. cyclopentane.	741051
3.5	**Hexadecyl**						
	$C_{16}H_{33}$ + O_2 → $C_{16}H_{33}OO$·	1.5×10^9		n-$C_{16}H_{34}$	p.r.	P.b.k. at 270 nm in Ar/O_2 satd. soln.; mixture of radicals from solvent; same k for heptadecyl in n-heptadecane.	87A282
3.6	**Cyclohexadienyl**						
	C_6H_7 + O_2 → C_6H_7OO·	1.6×10^9		Benzene	f.p.	D.k. at 315 nm in N_2/O_2 satd. soln. contg. 20% di-*tert*-butyl peroxide; at 300 K.	83A161
3.7	**2-Hydroxycyclohexadienyl**						
	C_6H_6OH + O_2 → HOC_6H_6OO·	5.0×10^8		Water	p.r.	D.k. at 313 nm in oxygen-satd. soln. contg. benzene.	620019
		3.9×10^8		Water	p.r.	D.k. N_2O/O_2 satd. soln. contg. benzene.	761212
3.8	**2,6-Di-*tert*-butyl-1-hydroxy-4-methylcyclohexadienyl**						
	DTBMPhOH(H) + O_2 → DTBMPhOH(H)OO·	9×10^7		n-$C_{17}H_{36}$	p.r.	D.k. at 360 nm in O_2 satd. soln. contg. di-*tert*-butyl-4-methylphenol.	87A282
3.9	**Benzyl**						
	$C_6H_5\dot{C}H_2$ + O_2 → $C_6H_5CH_2OO$·	2.8×10^9		Hexane	f.p.	D.k. at 317 nm in N_2/O_2 satd. soln. contg. dibenzyl ketone or *tert*-butyl phenylperacetate; at 300 K.	83A161
		2.4×10^9		c-C_6H_{12}			
		1.0×10^9		n-$C_{16}H_{34}$			
		2.9×10^9		Benzene			
		3.4×10^9		Acetonitrile			
		2.5×10^9		2-PrOH			
		2.0×10^9	7	Water	p.r.	D.k. at 316 nm in N_2/O_2 satd. soln. contg. 2% *tert*-BuOH and ~10^{-3} mol L^{-1} benzyl chloride.	89A165
3.10	**4-Nitrobenzyl**						
	4-$NO_2C_6H_4\dot{C}H_2$ + O_2 → 4-$NO_2C_6H_4CH_2OO$·	9×10^8	7	Water/ 2-PrOH	p.r.	D.k. at 360 nm in N_2/O_2 satd. soln. contg. 10% 2-PrOH and 3×10^{-4} mol L^{-1} 4-nitrobenzyl bromide.	89A165
3.11	**Diphenylmethyl**						
	$(C_6H_5)_2\dot{C}H$ + O_2 → $(C_6H_5)_2CHOO$·	7.5×10^8	6.5	Water/ 2-PrOH	p.r.	D.k. at 328 nm in N_2/O_2 satd. soln. contg. 10% 2-PrOH and 5×10^{-3} mol L^{-1} diphenylmethylammonium ion.	89A165
3.12	**Hydroxymethyl**						
	·CH_2OH + O_2 → $HOCH_2OO$·	4.9×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} MeOH and ferricyanide; k(R + ferricyanide) = 4.0×10^9.	690522

TABLE 3. Rate constants for reactions R· + O_2 → ROO·—Continued

No.	Radical/Reaction	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
3.12	**Hydroxymethyl**—Continued						
		4.2×10^9	10.7	Water	p.r.	P.b.k. of O_2^- formn. at 248 nm in N_2O/O_2 satd. soln. contg. MeOH.	741099
3.13	**1-Hydroxyethyl**						
	$CH_3\dot{C}HOH + O_2 \rightarrow CH_3CH(OH)OO\cdot$	4.6×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} EtOH and ferricyanide; k(R + ferricyanide) = 5.3×10^9.	690522
3.14	**2-Hydroxyethyl**						
	$\cdot CH_2CH_2OH + O_2 \rightarrow HOCH_2CH_2OO\cdot$	6.6×10^9	1	Water	p.r.	P.b.k. at 240 nm; radical from OH addn. in soln. contg. ethylene-O_2 (99:1); includes O_2 reaction with $\cdot C_2H_5$ from H addn.	670269
3.15	**1-Hydroxypropyl**						
	$CH_3CH_2\dot{C}HOH + O_2 \rightarrow CH_3CH_2CH(OH)OO\cdot$	4.7×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} 1-PrOH and ferricyanide; k(R + ferricyanide) = 3.7×10^9.	690522
3.16	**1-Hydroxy-1-methylethyl**						
	$(CH_3)_2\dot{C}OH + O_2 \rightarrow (CH_3)_2C(OH)OO\cdot$	4.2×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and ferricyanide; k(R + ferricyanide) = 4.7×10^9.	690522
		3.5×10^9	5-6	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} 2-PrOH soln. and *p*-nitroacetophenone; k(R + PNAP) = 3.8×10^9.	710618
		4.5×10^9	~0.3	Water	p.r.	D.k. at 290-300 nm in air-satd. soln. contg. 1 mol L^{-1} 2-PrOH and 0.5 mol L^{-1} $HClO_4$.	741074
		3.9×10^9		2-PrOH	f.p.	D.k. at 355 nm in N_2/O_2 satd. soln. contg. acetone; at 300 K.	83A161
3.17	**1-Hydroxy-1-methylpropyl**						
	$CH_3CH_2\dot{C}OHCH_3 + O_2 \rightarrow CH_3CH_2C(CH_3)(OH)OO\cdot$	4.0×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} 2-BuOH with ferricyanide; k(R + ferricyanide) = 4.8×10^9.	690522
3.18	**1-Hydroxy-2-methylpropyl**						
	$(CH_3)_2CH\dot{C}HOH + O_2 \rightarrow (CH_3)_2CHCH(OH)OO\cdot$	3.4×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} 2-methyl-1-propanol with ferricyanide; k(R + ferricyanide) = 3.0×10^9.	690522
3.19	**2-Hydroxyethenyl**						
	$HOCH{=}CH\cdot + O_2 \rightarrow HOCH{=}CHOO\cdot$	1.0×10^9		Water	p.r.	Condy. buildup in soln. contg. N_2O/O_2 and acetylene.	81A371
3.20	**Dihydroxymethyl**						
	$\cdot CH(OH)_2 + O_2 \rightarrow CH(OH)_2OO\cdot$	7.7×10^8	5.7	Water	p.r.	D.k. at 250 nm in N_2O-satd. soln. contg. formaldehyde, as well as condy. increase.	710424
		4.5×10^9	3.5-6.5	Water	p.r.	Increase in condy obs. in N_2O/O_2 (80/20 v:v) satd. soln. contg. 5×10^{-3} mol L^{-1} formaldehyde and $2\text{-}27 \times 10^{-5}$ mol L^{-1} oxygen.	80A282
3.21	**1,2-Dihydroxyethyl**						
	$\cdot CHOHCH_2OH + O_2 \rightarrow \cdot OOCHOHCH_2OH$	3.2×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} ethylene glycol with ferricyanide; k(R + ferricyanide) = 3.6×10^9.	690522

TABLE 3. Rate constants for reactions $R\cdot + O_2 \rightarrow ROO\cdot$—Continued

No.	Radical/Reaction	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
3.22	**1,2,3-Trihydroxypropyl**						
	$\cdot CHOHCHOHCH_2OH + O_2 \rightarrow \cdot OOCHOHCHOHCH_2OH$	3.3×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.4 mol L^{-1} glycerol with ferricyanide; k(R + ferricyanide) = 3.3×10^9.	690522
3.23	**Radicals from deoxyribose**						
	$dR\cdot + O_2 \rightarrow dROO\cdot$	2.0×10^9	5-6	Water	p.r.	C.k. with ferricyanide in N_2O-satd. soln. contg. deoxyribose; rel. to k(R + ferricyanide) = 2.8×10^9.	710618
3.24	**Radicals from glucose**						
	$R\cdot + O_2 \rightarrow ROO\cdot$	1.6×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} glucose and ferricyanide; k(R + ferricyanide) = 1.9×10^9.	690522
3.25	**Radicals from polyethylene oxide**						
	$R\cdot + O_2 \rightarrow ROO\cdot$	2.9×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} polyethylene oxide PEO 200 and ferricyanide; k(R + ferricyanide) = 3.2×10^9; k = 1.9 and 2.2×10^9, resp. for PEO 6,000 and 20,000.	690522
3.26	**2-Oxopropyl**						
	$\cdot CH_2COCH_3 + O_2 \rightarrow CH_3COCH_2OO\cdot$	3.1×10^9		Water	p.r.	P.b.k. at 350 nm in N_2O/O_2 satd. soln. contg. 10^{-2} mol L^{-1} acetone.	86A285
3.27	**Carboxymethyl, anion**						
	$\cdot CH_2CO_2^- + O_2 \rightarrow \cdot OOCH_2CO_2^-$	1.7×10^9	8	Water	p.r.	P.b.k. at 275 nm in N_2O/O_2 (4:1 v/v) satd. soln. contg. 0.01 mol L^{-1} acetate ion.	85A106
		2.1×10^9	8.2	Water	p.r.	D.k. at 366 nm in N_2O/O_2 satd. soln. contg. 0.01 mol L^{-1} acetate; cor. for k(R + R) = 5.5×10^8.	761082
		3×10^9	8	Water	p.r.	D.k. at 370 nm in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} acetate.	761207
3.28	**Carboxy(hydroxy)methyl, anion**						
	$\cdot CHOHCO_2^- + O_2 \rightarrow \cdot OOCHOHCO_2^-$	1.8×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} glycolate and ferricyanide; k(R + ferricyanide) = 5×10^8.	690522
3.29	**1-Carboxy-1-hydroxyethyl, anion**						
	$CH_3\dot{C}OHCO_2^- + O_2 \rightarrow CH_3C(OO\cdot)(OH)CO_2^-$	2.6×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} lactate and ferricyanide; k(R + ferricyanide) = 1.5×10^9	690522
3.30	**Acetoxymethyl**						
	$CH_3CO_2\dot{C}H_2 + O_2 \rightarrow AcOCH_2OO\cdot$	1.4×10^{10}	6.4	Water	p.r.	P.b.k. at 260 nm in N_2O/O_2 satd. soln. contg. methyl acetate and 6.26×10^{-5} mol L^{-1} oxygen.	78A402
3.31	**Methoxycarbonylmethyl**						
	$\cdot CH_2CO_2CH_3 + O_2 \rightarrow \cdot OOCH_2CO_2CH_3$	1.8×10^9	4	Water	p.r.	D.k. at 340 nm in soln. contg. 1×10^{-3} mol L^{-1} methyl chloroacetate, 5×10^{-2} mol L^{-1} formate ion and $0.6\text{-}2 \times 10^{-4}$ mol L^{-1} oxygen.	78A402

TABLE 3. Rate constants for reactions R· + O_2 → ROO·—Continued

No.	Radical/Reaction	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
3.32	**Dimethylaminomethyl**						
	$\cdot CH_2N(CH_3)_2 + O_2 \rightarrow (CH_3)_2NCH_2OO\cdot$	3.5×10^9	10.4	Water	p.r.	D.k. at 260 nm in N_2O-satd. 10^{-3} mol L^{-1} trimethylamine soln. contg. 7-14 $\times 10^{-5}$ mol L^{-1} oxygen; products are $O_2^- + (CH_3)_2N^+{=}CH_2$, which may be formed directly by electron transfer, or by decay of a peroxyl radical.	87A128
3.33	**Amino(carboxy)methyl, anion**						
	$H_2N\dot{C}HCO_2^- + O_2 \rightarrow NH_2CH_2(CO_2^-)OO\cdot$	$\sim 1 \times 10^9$	7.9	Water	p.r.	D.k. at 307 nm in N_2O/O_2 satd. 0.2 mol L^{-1} glycine soln.; also c.k. with ferricyanide.	761082
3.34	**Carboxy(carboxymethylamino)methyl, dianion**						
	$^-O_2CCH_2NH\dot{C}HCO_2^- + O_2 \rightarrow {}^-O_2CCH_2NHCH(OO\cdot)CO_2^-$	8×10^8	7	Water	p.r.	D.k. in N_2O-satd. soln. contg. iminodiacetate.	81A023
3.35	**2-Amino-2-carboxy-1-hydroxyethyl, anion**						
	$\cdot CHOHCH(NH_2)CO_2^- + O_2 \rightarrow \cdot OOCHOHCH(NH_2)CO_2^-$	2.4×10^9	7	Water	p.r.	C.k. in N_2O/O_2 satd. soln. contg. 0.3 mol L^{-1} serine and ferricyanide; k(R + ferricyanide) = 3.2×10^9.	690522
3.36	**2,2,2-Trifluoro-1-(difluoromethoxy)ethyl**						
	$CHF_2O\dot{C}HCF_3 + O_2 \rightarrow CHF_2OCH(OO\cdot)CF_3$	1.4×10^9		Water	p.r.	Eval. from leveling off of rate of reaction of peroxyl radical with ABTS, chlorpromazine, promethazine, ascorbate and propyl gallate at high concn. of substrates in air-satd. soln. contg. 0.5-1 mol L^{-1} *tert*-BuOH and isoflurane.	88A364
3.37	**1,2,2-Trifluoro-2-(difluoromethoxy)ethyl**						
	$CHF_2OCF_2\dot{C}HF + O_2 \rightarrow CHF_2OCF_2CHFOO\cdot$	1.2×10^9		Water	p.r.	See entry 3.36; soln. contg. isoflurane	88A364
3.38	**Chloromethyl**						
	$\cdot CH_2Cl + O_2 \rightarrow CH_2ClOO\cdot$	6.3×10^9		CH_2Cl_2	p.r.	P.b.k. at 255 nm.	82B130
3.39	**1-Chloroethyl**						
	$CH_3\dot{C}HCl + O_2 \rightarrow CH_3CHClOO\cdot$	9.0×10^8		Water	p.r.	See entry 3.36; soln. contg. 1,1-dichloroethane.	88A364
3.40	**1-Chloro-2,2,2-trifluoroethyl**						
	$CF_3\dot{C}HCl + O_2 \rightarrow CF_3CHClOO\cdot$	1.3×10^9		Water/ *tert*-BuOH	p.r.	See entry 3.36; soln. contg. 10% *tert*-BuOH and halothane.	83A195
3.41	**1-Chloro-2,2-difluoro-2-methoxyethyl**						
	$CH_3OCF_2\dot{C}HCl + O_2 \rightarrow CH_3OCF_2CHClOO\cdot$	1.3×10^9		Water	p.r.	See entry 3.36; soln. contg. methoxyflurane.	88A364
3.42	**Dichloromethyl**						
	$\cdot CHCl_2 + O_2 \rightarrow CHCl_2OO\cdot$	4.7×10^9		$CHCl_3$	p.r.	P.b.k. at 255 nm.	82B130
3.43	**1,1-Dichloroethyl**						
	$CH_3\dot{C}Cl_2 + O_2 \rightarrow CH_3CCl_2OO\cdot$	1.5×10^9		Water	p.r.	See entry 3.36; soln. contg. 1,1,1-trichloroethane.	88A364
3.44	**1,2-Dichloroethyl**						
	$CH_2Cl\dot{C}HCl + O_2 \rightarrow CH_2ClCHClOO\cdot$	9.7×10^8		Water	p.r.	See entry 3.36; soln. contg. 1,1,2-trichloroethane.	88A364

TABLE 3. Rate constants for reactions R· + O_2 → ROO·—Continued

No.	Radical/Reaction	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
3.45	**Dichloro(cyano)methyl**						
	$\dot{C}Cl_2CN + O_2 \rightarrow CCl_2(CN)OO\cdot$	3.9×10^8		Water	p.r.	See entry 3.36; soln. contg. trichloroacetonitrile.	88A364
3.46	**1,2-Dichloro-1,2,2-trifluoroethyl**						
	$CClF_2\dot{C}ClF + O_2 \rightarrow CClF_2CClFOO\cdot$	1.6×10^9		Water	p.r.	See entry 3.36; soln. contg. 1,1,2-trichloro-1,2,2-trifluoroethane; includes $CCl_2F\dot{C}F_2 + O_2 \rightarrow CCl_2FCF_2OO\cdot$.	88A364
3.47	**Trichloromethyl**						
	$\cdot CCl_3 + O_2 \rightarrow CCl_3OO\cdot$	3.3×10^9		Water/ 2-PrOH	p.r.	See entry 3.36; soln. contg. metiazinic acid, 30% 2-PrOH, 10% acetone and 0.04 mol L^{-1} carbon tetrachloride.	83G216
3.48	**Pentachloroethyl**						
	$CCl_3\dot{C}Cl_2 + O_2 \rightarrow CCl_3CCl_2OO\cdot$	2.1×10^9		Water/ *tert*-BuOH	p.r.	See entry 3.36; soln. contg. 40% *tert*-BuOH and hexachloroethane.	88A364
3.49	**Radicals from oleate**						
	$L\cdot + O_2 \rightarrow LOO\cdot$	1.0×10^9	13	Water	p.r.	D.k. at 280 nm in N_2O/O_2 satd. soln. contg. ~ $4\text{-}8 \times 10^{-4}$ mol L^{-1} oleate.	78A365
3.50	**Radicals from linoleate**						
	$L\cdot + O_2 \rightarrow LOO\cdot$	3×10^8	10.5, 13	Water	p.r.	D.k. at 280 nm in N_2O/O_2 satd. soln. contg. 10^{-2} mol L^{-1} linoleate and 0.02 mol L^{-1} phosphate.	78A365
3.51	**Radicals from linolenate**						
	$L\cdot + O_2 \rightarrow LOO\cdot$	3×10^8	10.5, 13	Water	p.r.	D.k. at 280 nm in N_2O/O_2 satd. soln. contg. ~ $4\text{-}8 \times 10^{-4}$ mol L^{-1} linolenate.	78A365
		3.2×10^8	10.9	Water	p.r.	D.k. at 280 nm of the pentadienyl radical produced (10%) in N_2O/O_2 satd. soln. of linolenate.	87A277
3.52	**Radicals from arachidonate**						
	$L\cdot + O_2 \rightarrow LOO\cdot$	2×10^8	13	Water	p.r.	D.k. at 280 nm in N_2O/O_2 satd. soln. contg. ~ $4\text{-}8 \times 10^{-4}$ mol L^{-1} arachidonate.	78A365
3.53	**Phenylalanine OH-adduct**						
	$PheOH + O_2 \rightarrow PheOH(OO\cdot)$	4×10^8		Water	p.r.		81A376
3.54	**3,6-Dioxo-2-piperazinyl**						
	$-CH_2CONH\dot{C}HCONH- + O_2 \rightarrow$ $-NHCH(OO\cdot)CONHCH_2CO-$	1.2×10^9 2.8×10^8	5.6 12.0	Water	p.r.	D.k. at 360 nm in N_2O/O_2 satd. soln. contg. glycine anhydride.	710554
		2.0×10^9	6.5, 11.7	Water	p.r.	D.k. at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. glycine anhydride.	89A245
3.55	**2,5-Dimethyl-3,6-dioxo-2-piperazinyl**						
	$-NHCO\dot{C}(Me)NHCOCH(Me)- + O_2$ → $-NHC(Me)(OO\cdot)CONHCH(Me)CO-$	1.0×10^9 1.1×10^9	5.4 12.0	Water	p.r.	D.k. at 360 nm in N_2O/O_2 satd. soln. alanine anhydride.	710554
		2.3×10^9 2.1×10^9	6.2 11.7	Water	p.r.	D.k. at 360 nm in N_2O/O_2 (4:1) satd. soln. alanine anhydride.	89A245
3.56	**1,4-Dimethyl-3,6-dioxo-2-piperazinyl**						
	$-N(Me)CO\dot{C}HN(Me)COCH_2- + O_2$ → $-N(Me)CH(OO\cdot)CON(Me)CH_2CO-$	9×10^8	5.2	Water	p.r.	D.k. at 360 nm in N_2O/O_2 satd. soln. contg. sarcosine anhydride.	710554
		2.0×10^9	6.0, 11.7	Water	p.r.	D.k. at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. sarcosine anhydride.	89A245

TABLE 3. Rate constants for reactions R· + O_2 → ROO·—Continued

No.	Radical/Reaction	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
3.57	**Thymine radical anion**						
	[5 MeU]·$^-$ + O_2 → 5-MeU$^-$OO· → 5-MeU + O_2^-	4.5×10^9	6.4	Water	p.r.	D.k. at 320 nm in Ar/O_2 satd. soln. contg. 1 mol L^{-1} *tert*-BuOH, 1.1×10^{-4} mol L^{-1} oxygen and 10^{-2} mol L^{-1} thymine.	87A207
3.58	**Thymine radical**						
	5-MeU(H)· + O_2 → 5-MeU(H)OO· → 5-MeU + HO_2	2×10^9	3.8	Water	p.r.	D.k. at 320 nm in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH, 1.1×10^{-4} mol L^{-1} oxygen and 10^{-2} mol L^{-1} thymine.	87A207
3.59	**Uracil-OH adduct**						
	U-OH + O_2 → U(OH)OO·	2.1×10^9		Water	p.r.	D.k. at 400 nm in N_2O/O_2 satd. soln. contg. uracil.	700795
		1.6×10^9	7	Water	p.r.	D.k. at 420 nm in N_2O/O_2 satd. soln. contg. 10^{-3} mol L^{-1} uracil.	710256
3.60	**Cytosine-OH adduct**						
	Cy(OH) + O_2 → Cy(OH)OO·	2.0×10^9		Water	p.r.	D.k. at 350 or 435 nm in N_2O/O_2 satd. soln. contg. cytosine.	700795
3.61	**Thymine-OH adduct**						
	5-MeU-OH + O_2 → 5-MeU(OH)OO·	1.5×10^9		Water	p.r.	D.k. at 320 nm in Ar/O_2 satd. soln. contg. thymine.	701103
		1.9×10^9		Water	p.r.	D.k. at 400 nm in N_2O/O_2 satd. soln. contg. thymine.	700795
3.62	**Dimethyluracil-OH adduct**						
	DMU(OH) + O_2 → DMU(OH)OO·	1.9×10^9		Water	p.r.	D.k. at 400 nm.	700795
3.63	**Deoxyadenosine OH-adduct**						
	dA-OH + O_2 → dA(OH)OO·	8×10^8		Water	p.r.	D.k. at 400 nm in soln. contg. oxygen ($85\text{-}170 \times 10^{-6}$ mol L^{-1}) and 2'-deoxyadenosine.	85R131
3.64	***N*^{6},*N*^{6}-Dimethyladenosine-4-OH adduct**						
	DMA-4-OH + O_2 → DMA(4-OH)OO·	$<4 \times 10^8$		Water	p.r.	P.b.k. in N_2O-satd. soln. contg. *N*^{6},*N*^{6}-dimethyladenosine and 1×10^{-3} mol L^{-1} oxygen.	87A362
3.65	***N*^{6},*N*^{6}-Dimethyladenosine-5-OH adduct**						
	DMA-5-OH + O_2 → DMA(5-OH)OO·	$>2.2 \times 10^{10}$		Water	p.r.	P.b.k. in N_2O-satd. soln. contg. *N*^{6},*N*^{6}-dimethyladenosine and 2.2×10^{-5} mol L^{-1} oxygen.	87A362
3.66	***N*^{6},*N*^{6}-Dimethyladenosine-8-OH adduct**						
	DMA-8-OH + O_2 → DMA(8-OH)OO·	$>1.6 \times 10^{10}$		Water	p.r.	P.b.k. in N_2O-satd. soln. contg. *N*^{6},*N*^{6}-dimethyladenosine and 6×10^{-6} mol L^{-1} oxygen.	87A362
3.67	**Thymidine-OH adduct**						
	T-OH + O_2 → T(OH)OO·	1.0×10^9		Water	p.r.	D.k. at 350 nm.	700795
3.68	**Thymidine-6-OH adduct**						
	T-OH + O_2 → T(OH)OO·	2.5×10^7		Water	p.r.	Hydration of radical cation from sulfate radical reaction.	87A337
3.69	**Cytidine-OH adduct**						
	Cy(OH) + O_2 → Cy(OH)OO·	1.2×10^9		Water	p.r.	D.k. at 350 nm.	700795
3.70	**Uridine-OH adduct**						
	Ur(OH) + O_2 → Ur(OH)OO·	1.2×10^9		Water	p.r.	D.k. at 400 nm.	700795

TABLE 3. Rate constants for reactions R· + O_2 → ROO·—Continued

No.	Radical/Reaction	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
3.71	**Thymidylic acid-OH adduct**						
	TMP(OH) + O_2 → TMP(OH)OO·	8.0×10^8		Water	p.r.	D.k. at 350 or 400 nm.	700795
3.72	**Cytidylic acid-OH adduct**						
	CMP-OH + O_2 → CMP(OH)OO·	1.0×10^9		Water	p.r.	D.k. at 350 nm.	700795
3.73	**Deoxycytidylic acid-OH adduct**						
	dCMP(OH) + O_2 → dCMP(OH)OO·	1.1×10^9		Water	p.r.	D.k. at 350.	700795
3.74	**DNA-OH adduct**						
	DNA(OH) + O_2 → ssDNA(OH)OO·	$\sim 3 \times 10^8$		Water			84A231
		5×10^8	7	Water	p.r.	D.k. at 360 nm in N_2O/O_2 satd. soln. contg. denatured DNA.	80A124

TABLE 4. Rate constants for proton transfer, hydrolysis and first-order decomposition of peroxyl radicals in aqueous soln.

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
4.1	**Hydroxymethylperoxyl**								
4.1.1	**First order decomposition**								
	$HOCH_2OO\cdot \rightarrow O_2\cdot^- + HCHO + H^+$	$<1 \times 10^1\ s^{-1}$	6.7	RT			f.p.	Buildup of condy. in O_2 satd. soln. contg. 1-40 $\times 10^{-3}$ mol L^{-1} H_2O_2 and 5 $\times 10^{-2}$-6.5 mol L^{-1} MeOH; also detd. by esr technique.	777495 78A339
		$<3\ s^{-1}$		RT			p.r.		741099
4.1.2	**Hydrogen phosphate ion**								
	$HOCH_2OO\cdot + HPO_4^{2-} \rightarrow H_2PO_4^- + {}^-OCH_2OO\cdot$	$\sim 2 \times 10^6$	7-9	295			p.r.	Calcd. from effect of phosphate ion on p.b.k. at 248 nm in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} MeOH.	741099
4.1.3	**Hydroxide ion**								
	$HOCH_2OO\cdot + OH^- \rightarrow H_2O + {}^-OCH_2OO\cdot$	1.8×10^{10}		295			p.r.	Calcd. from effect of pH on p.b.k. at 248 nm in N_2O/O_2 satd. soln. contg. 0.1 mol L^{-1} MeOH.	741099
		1.5×10^{10}		295			f.p.	Buildup of condy. in O_2 satd. soln. contg. 1-40 $\times 10^{-3}$ mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} MeOH.	777495
4.2	**1-Hydroxyethylperoxyl**								
4.2.1	**First order decomposition**								
	$CH_3CH(OH)OO\cdot \rightarrow O_2\cdot^- + CH_3CHO + H^+$	$5.2 \times 10^1\ s^{-1}$		RT			f.p.	Buildup of condy. in O_2 satd. soln. contg. 1-40 $\times 10^{-3}$ mol L^{-1} H_2O_2 and 5 $\times 10^{-2}$-6.5 mol L^{-1} EtOH; also detd. by esr technique.	777495
		$5.0 \times 10^1\ s^{-1}$	5.5	295	12.3	60	f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} EtOH; calcd. $k(298\ K) = 6 \times 10^1\ s^{-1}$.	78A339
		$5.0 \times 10^1\ s^{-1}$			12.3	66	p.r.		83A056
4.2.2	**Hydroxide ion**								
	$CH_3CH(OH)OO\cdot + OH^- \rightarrow CH_3CH(O^-)OO\cdot + H_2O$	4×10^9	5.3-8.0	293			p.r.	Condy. kinetics in N_2O/O_2 (4:1 v/v) satd. soln. contg. 0.1 mol L^{-1} EtOH.	83A056
		8×10^9		295		60	f.p.	Buildup of condy. in O_2 satd. soln. contg. 1-40 $\times 10^{-3}$ mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} EtOH.	777495
4.2.3	**Hydrogen phosphate ion**								
	$CH_3CH(OH)OO\cdot + HPO_4^{2-} \rightarrow CH_3CH(O^-)OO\cdot + H_2PO_4^-$	4×10^6	6.7	RT				D.k. at 244 nm in N_2O/O_2 (4:1 v/v) satd. soln. contg. 0.1 mol L^{-1} EtOH and phosphate buffer.	83A056
4.3	**1-Hydroxy-1-methylethylperoxyl**								
4.3.1	**First order decomposition**								
	$(CH_3)_2C(OH)OO\cdot \rightarrow O_2\cdot^- + CH_3COCH_3 + H^+$	$6.65 \times 10^2\ s^{-1}$		RT			f.p.	Buildup of condy. in O_2 satd. soln. contg. 1-40 $\times 10^{-3}$ mol L^{-1} H_2O_2 and 5 $\times 10^{-2}$-6.5 mol L^{-1} 2-PrOH; also detd. by esr technique.	777495

TABLE 4. Rate constants for proton transfer, hydrolysis and first-order decomposition of peroxyl radicals in aqueous soln.—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
4.3	**1-Hydroxy-1-methylethylperoxyl**—Continued								
4.3.1	**First order decomposition**—Continued								
		$6.5 \times 10^2\ s^{-1}$	5.5	295	12.8	56	f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} 2-PrOH; calcd. $k(298\ K) = 9.15 \times 10^2\ s^{-1}$.	78A339
		$7 \times 10^2\ s^{-1}$	4	RT			p.r.	P.b.k. at 350 nm (nitroform) in N_2O/O_2 (1:1) satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 4×10^{-5} mol L^{-1} tetranitromethane; cor. for competing first-order loss of ROO·.	761081
4.3.2	**Hydrogen phosphate ion**								
	$(CH_3)_2C(OH)OO\cdot + HPO_4^{2-} \rightarrow (CH_3)_2C(O^-)OO\cdot + H_2PO_4^-$	1.1×10^7	7.3	295			p.r.	P.b.k. at 248 nm of O_2^- in N_2O/O_2 (2:1 v/v) satd. soln. contg. 0.5 mol L^{-1} 2-PrOH.	761081
4.3.3	**Hydroxide ion**								
	$(CH_3)_2C(OH)OO\cdot + OH^- \rightarrow (CH_3)_2C(O^-)OO\cdot + H_2O$	5.2×10^9		295			p.r.	P.b.k. at 248 nm of O_2^- in N_2O/O_2 (2:1 v/v) satd. soln. contg. 0.5 mol L^{-1} 2-PrOH at various pH.	761081
		5×10^9		295			f.p.	Buildup of condy. in oxygen-satd. soln. contg. 5×10^{-2} mol L^{-1} 2-PrOH and 10^{-3} mol L^{-1} H_2O_2.	777495
4.4	**Dihydroxymethylperoxyl**								
4.4.1	**First order decomposition**								
	$CH(OH)_2OO\cdot \rightarrow O_2\cdot^- + HCO_2H$	$>10^6\ s^{-1}$		RT					80A282
4.5	**1,2-Dihydroxyethylperoxyl**								
4.5.1	**First order decomposition**								
	$\cdot OOCHOHCH_2OH \rightarrow O_2\cdot^- + HOCH_2CHO + H^+$	$1.9 \times 10^2\ s^{-1}$	5.5	295	8.3	33	f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} ethylene glycol; calc. $k(298\ K) = 3.3 \times 10^2\ s^{-1}$.	78A339
4.6	**1,2,3-Trihydroxypropylperoxyl**								
4.6.1	**First order decomposition**								
	$\cdot OOCHOHCHOHCH_2OH \rightarrow O_2\cdot^- + H^+ + HOCH_2CH(OH)CHO$	$2.1 \times 10^2\ s^{-1}$	5.5	295	9.7	41.5	f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} glycerol; calc. $k(298\ K) = 2.7 \times 10^2\ s^{-1}$; decay rate of $3 \times 10^3\ s^{-1}$ obs. for other radical from glycerol.	78A339
4.7	**1,2,3,4-Tetrahydroxybutylperoxyl**								
4.7.1	**First order decomposition**								
	$HOCH_2CHOHCHOHCH(OH)OO\cdot \rightarrow O_2\cdot^- + HOCH_2[CH(OH)]_2CHO + H^+$	$1.9 \times 10^2\ s^{-1}$	5.5	295			f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} *meso*-erythritol; decay rate of $3 \times 10^3\ s^{-1}$ obs. for other radical from erythritol.	78A339

TABLE 4. Rate constants for proton transfer, hydrolysis and first-order decomposition of peroxyl radicals in aqueous soln.—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	T (K)	log A	E_a (kJ mol^{-1})	Method	Comment	Ref.
4.8	**1,2,3,4,5-Pentahydroxypentylperoxyl**								
4.8.1	**First order decomposition**								
	$HOCH_2[CH(OH)]_3CH(OH)OO\cdot \rightarrow O_2\cdot^- + HOCH_2[CH(OH)]_3CHO + H^+$	2.2×10^2 s^{-1}	5.5	295	11.4	52	f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} xylitol; decay rate of 2.8×10^3 s^{-1} obs. for other radical from xylitol.	78A339
4.9	**Peroxyl radicals from glucitol**								
4.9.1	**First order decomposition**								
	$ROO\cdot \rightarrow O_2\cdot^- + HOCH_2[CH(OH)]_4CHO + H^+$	2.1×10^2 s^{-1}	5.5	295			f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} glucitol; decay rate of 2.7×10^3 s^{-1} obs. for other radical from glucitol.	78A339
4.10	**Peroxyl radicals from inositol**								
4.10.1	**First order decomposition**								
	$ROO\cdot \rightarrow O_2\cdot^- + HOCH_2[CH(OH)]_4CHO + H^+$	4.7×10^2 s^{-1}	5.5	295	10.7	46	f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} *myo*-inositol; decay rate of 2.6×10^3 s^{-1} ($E_a = 64.5$ kJ mol^{-1}, log A = 14.85) obs. for other radical from *myo*-inositol.	78A339
4.11	**Peroxyl radicals from glucose**								
4.11.1	**First order decomposition**								
	$ROO\cdot \rightarrow O_2\cdot^- + H^+$	4.0×10^2 s^{-1}	5.5	295	10.7	46	f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} glucose; decay rates of 2.6×10^3 s^{-1} ($E_a = 64.5$ kJ mol^{-1}, log A = 14.85) and $>7 \times 10^4$ s^{-1} obs. for other radical from glucose.	78A339
4.12	**Peroxyl radicals from methyl α-D-glucopyranoside**								
4.12.1	**First order decomposition**								
	$ROO\cdot \rightarrow O_2\cdot^- + H^+$	4.0×10^2 s^{-1}	5.5	295			f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} methyl α-D-glucoside; decay rate of 2×10^3 s^{-1} obs. for other radical from methyl α-D-glucoside.	78A339
4.13	**Isopropoxy(dimethyl)methylperoxyl**								
4.13.1	**First order decomposition**								
	$(CH_3)_2CHOC(CH_3)_2OO\cdot \rightarrow O_2\cdot^- + H^+$	$<1 \times 10^1$ s^{-1}	5.5	295			f.p.	Buildup of condy. in O_2 satd. soln. contg. 2×10^{-3} mol L^{-1} H_2O_2 and 10^{-2} mol L^{-1} bis(1-methylethyl) ether.	78A339
4.14	**1,1-Dimethoxyethylperoxyl**								
4.14.1	**First order decomposition**								
	$CH_3C(OCH_3)_2OO\cdot \rightarrow O_2\cdot^- + CH_3C(OCH_3)_2^+$	6.5×10^4 s^{-1}	5	293			p.r.	Buildup of condy. in N_2O/O_2 (4:1 v/v) satd. soln. contg. 2×10^{-3} mol L^{-1} acetaldehyde dimethyl acetal.	89A902

TABLE 4. Rate constants for proton transfer, hydrolysis and first-order decomposition of peroxyl radicals in aqueous soln.—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
4.14	**1,1-Dimethoxyethylperoxyl**—Continued								
4.14.1	**First order decomposition**—Continued								
		$7 \times 10^4\ s^{-1}$					p.r.	Buildup of condy. in soln. contg. acetaldehyde dimethyl acetal and oxygen.	87A490
4.15	**Amino(carboxy)methylperoxyl**								
4.15.1	**First order decomposition**								
	$NH_2CH_2(CO_2^-)OO\cdot \rightarrow O_2\cdot^-$	$1.5 \times 10^5\ s^{-1}$	7.9	RT			p.r.	D.k. at 307 nm in N_2O_2/O_2 (1:1) satd. soln. contg. 0.2 mol L^{-1} glycine.	761082
4.16	**3,6-Dioxopiperazinylperoxyl, conjugate base**								
4.16.1	**First order decomposition**								
	$-N^-CH(OO\cdot)CONHCH_2CO- \rightarrow O_2\cdot^- + -N{=}CHCONHCH_2CO-$	$1.6 \times 10^5\ s^{-1}$	11.7	RT			p.r.	P.b.k. at 270 nm in N_2O/O_2 (1:1) satd. soln. contg. glycine anhydride; calcd. from kinetic model; $k < 1.2\ s^{-1}$ estd. from steady-state experiments for protonated radical (pK_a = 10.6).	87A490 89A225
4.17	**2,5-Dimethyl-3,6-dioxopiperazinylperoxyl, conjugate base**								
4.17.1	**First order decomposition**								
	$-N^-C(Me)(OO\cdot)CONHCH(Me)CO- \rightarrow O_2\cdot^- + -N{=}C(Me)CONHCH(Me)CO-$	$3.7 \times 10^6\ s^{-1}$		RT			p.r.	Calcd. from kinetic model; N_2O/O_2 (4:1) satd. soln. contg. alanine anhydride; pK_a of peroxyl radical = 11.2.	87A490 89A225
4.18	**Peroxyl radical of uracil-H adduct**								
4.18.1	**First order decomposition**								
	$U(H)OO\cdot \rightarrow O_2\cdot^- + U\text{-}H$	$8.3 \times 10^4\ s^{-1}$		RT			p.r.	P.b.k. at 260 nm, and also decrease in condy., in N_2O/O_2 (4:1) satd. soln. contg. 10^{-3} mol L^{-1} dihydrouracil at various pH; elimination of HO_2 from protonated radical was too slow to measure.	84G025
4.19	**Trichloromethylperoxyl**								
4.19.1	**First order decomposition**								
	$CCl_3OO\cdot \rightarrow$	$3 \times 10^4\ s^{-1}$		RT			p.r.		89A019

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals

No.	Radical	$2k$ (L mol^{-1} s^{-1})	pH	Solvent	T (K)	log $2A$	E_a (kJ mol^{-1})	Method	Comment	Ref.
5.1	**2-Propylperoxyl**									
	$(CH_3)_2CHOO\cdot$	1.2×10^6 [298 K]		c-C_5H_{10}		7.89	10.34	phot.	D.k. (esr) in air-satd. soln. contg. *trans*-1,1'-azobis(propane); also studied growth curves; see [87A284] for disproportionation/combination ratios in decane at 253-323 K; data from 155-210 K showed stronger T dependence probably due to tetraoxide formation; studied at 210-300 K.	87A283
		8.2×10^5 [298 K]		CF_2CCl_2		7.33	8.08			
		5.6×10^5 [298 K]		c-C_3H_6		7.05	7.42			
		1.2×10^6 [298 K]		Pentane		7.68	9.22			
		1.6×10^6 [298 K]		c-C_6H_{12} Decane Dodecane		9.70	20	phot.	D.k. in oxygen-satd. soln. contg. 2,4-dimethylpentanone; also studied growth curves; radical concn. calcd. from gas phase $\epsilon = 1145$ L mol^{-1} cm^{-1} at 250 nm; studied at 293-396 K.	87A215
		7.8×10^3 [200 K]		CF_2Cl_2		10.68	26	phot.	D.k. (esr) in oxygen-satd. soln.; radical from 1-methylethylformyl peroxide; studied at 186-229 K.	80A073
5.2	***sec*-Butylperoxyl**									
	$CH_3CH_2CH(CH_3)OO\cdot$	7.9×10^5 [200 K]		CF_2Cl_2		7.1	4.6	phot.	D.k. (esr) in oxygen-satd. soln.; radical from *sec*-butylformyl peroxide; studied at 175-200 K.	80A073
		1.1×10^0 [200 K]		Butane		9.0	11.3	phot.	D.k. (esr) in oxygen-satd. soln. contg. DTBP; T dependence greater below 193 K; studied at 193-257 K.	72A025
5.3	***tert*-Butylperoxyl**									
	$(CH_3)_3COO\cdot$	1.7×10^4		c-C_6H_{12}	293			phot.	D.k. (esr) in oxygen-satd. soln. contg. di-*tert*-butyl ketone; also studied growth curves; radical concn. calcd. from gas phase $\epsilon = 1042$ L mol^{-1} cm^{-1} at 250 nm.	87A215
		1.3×10^2 [200 K]		Heptane		9.1	26.8	phot.	D.k. (esr); soln. contg. (1-7) $\times 10^{-2}$ mol L^{-1} *tert* butyl hydroperoxide; studied at 209-262 K.	81A392
		4.9 [200 K]		Isobutane		9.2	32.6	phot.	D.k. (esr) in oxygen-satd. soln. contg. DTBP; log $2A$ — 9.3 and E_a — 31.8 from photolysis of *tert*-butyl hydroperoxide; T dependence greater below 193 K; studied at 193-257 K.	72A025
		8.6×10^2 [200 K]		3-MP		12.1	35.1	phot.	D.k. (esr) in soln. contg. 2.5% *tert*-butyl hydroperoxide; studied at 225-249 K.	677255

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.3	***tert*-Butylperoxyl**—Continued									
		1×10^4 2.5×10^4 4×10^3		MeOH Water Benzene	295			s.f.	D.k. (esr); radical from Ce^{4+} and *tert*-butyl hydroperoxide; phot. (esr) used in oxygen-satd. benzene soln. contg. azobisisobutyronitrile.	655049
5.4	**Pentylperoxyl**									
	$C_5H_{11}OO\cdot$	4×10^6 [298 K]		Pentane	233-310		10.9	p.r.	D.k. at 290 nm in oxygen-satd. soln.; ϵ = 910 $L\ mol^{-1}\ cm^{-1}$; radicals are a mixture of 63% 2-pentylperoxyl, 30% 3-pentylperoxyl and 7% 1-pentylperoxyl.	741019
5.5	**2,2-Dimethylpropylperoxyl**									
	$(CH_3)_3CCH_2OO\cdot$	$>4 \times 10^8$		Neopentane	253			phot.	From steady-state [ROO·] $<5 \times 10^{-8}$ mol L^{-1} at known photolysis rate; generation of ROO· confirmed by product analysis.	707039
5.6	**Peroxyl radical from cyclopentene**									
	$c\text{-}C_5H_7OO\cdot$	5.0×10^6 [200 K]		$c\text{-}C_5H_8$		7.8	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. DTBP; T dependence greater below 193 K; studied at 193-257 K.	72A025
5.7	**Cyclopentylperoxyl**									
	$c\text{-}C_5H_9OO\cdot$	1.5×10^7		Water	RT			p.r.	D.k. at 270 nm in N_2O/O_2 (4:1 v/v) satd. soln. contg. cyclopentane; ϵ = 1100 $L\ mol^{-1}\ cm^{-1}$.	84A324
		1.2×10^7		Water	296			p.r.	D.k. at 270 nm in N_2O/O_2 () satd. soln. contg. 2.5×10^{-3} mol L^{-1} cyclopentane; ϵ = 1450 $L\ mol^{-1}\ cm^{-1}$; uncertain whether k or $2k$.	741051
		5.7×10^6 [200 K]		CF_2Cl_2		9.6	10.9	phot.	D.k. (esr) in oxygen-satd. soln.; radical from cyclopentylformyl peroxide; studied at 175-200 K.	80A073
		4.0×10^6 [200 K]		$c\text{-}C_5H_{10}$		10.0	13	phot.	D.k. (esr) in oxygen-satd. soln. contg. DTBP; T dependence greater below 193 K; studied at 193-257 K.	72A025
		1.7×10^7		$c\text{-}C_5H_{10}$	298		24.7	p.r.	D.k. (esr) in O_2/Ar satd. soln.; T range not given.	680329

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ (L mol^{-1} s^{-1})	pH	Solvent	T (K)	log $2A$	E_a (kJ mol^{-1})	Method	Comment	Ref.
5.8	**Hexylperoxyl**									
	$C_6H_{13}OO\cdot$	9.7×10^5 [298 K]		Hexane		7.46	8.4	f.p.	D.k. in air- or oxygen-satd. soln. contg. *tert*-butyl hypochlorite; ϵ(260 nm) = 320 L mol^{-1} cm^{-1}; mostly *sec*-alkylperoxyl radicals; average for alkylperoxyl radicals from eight *n*-alkanes; studied at 283-320 K.	79B136
		1.1×10^7		Hexane	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.; mostly *sec*-alkylperoxyl radicals.	680329
5.9	**1,1-Dimethylbutylperoxyl**									
	$CH_3CH_2CH_2C(CH_3)_2OO\cdot$	1.9×10^4 [298 K]		2-MP		11.1	39	phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.5% DTBP; measured k due primarily to *tert*-peroxyl radicals; above 273 K decay due to *sec*-radical interferes; studied at 213-273 K.	707039
5.10	**Cyclohexenylperoxyl**									
	c-$C_6H_9OO\cdot$	2.0×10^7 [298 K]		Benzene		8.75	8.3	f.p.	D.k. at 300 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP and 0.1 mol L^{-1} cyclohexene; ϵ = 800 L mol^{-1} cm^{-1}; studied at 282-319 K.	85A466
5.11	**Cyclohexylperoxyl**									
	c-$C_6H_{11}OO\cdot$	3.8×10^6		Benzene	300			f.p.	D.k. at 300 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP and 0.1 mol L^{-1} cyclohexane; ϵ = 800 L mol^{-1} cm^{-1}.	85A466
		1.2×10^7		Water	RT			p.r.	D.k. at 260 nm in N_2O/O_2 (4:1 v/v) satd. soln. contg. cyclohexane; ϵ = 750 L mol^{-1} cm^{-1}.	84A324
		2.2×10^6 [298 K]		c-C_6H_{12}		7.29	5.4	f.p.	D.k. at 265 nm; air- or oxygen-satd. soln. contg. *tert*-butyl hypochlorite; ϵ cor. to 800 L mol^{-1} cm^{-1} [80A428]; studied at 285-333 K.	79A401
		2.3×10^6		c-C_6H_{12}	295			p.r.	D.k. at 240, 270-90 nm in oxygen-satd. soln. contg. cyclohexane; ϵ(255 nm) = 1900 L mol^{-1} cm^{-1}.	710136
		6.7×10^6		c-C_6H_{12}	298		28.9	p.r.	D.k. (esr) in O_2/Ar satd. soln.; no T range given.	680329
		1.6×10^6		c-C_6H_{12}	298-345			p.r.	D.k. at 275 nm in oxygen-satd. soln.; ϵ = 2000 L mol^{-1} cm^{-1}; spectrum shows structure not obs. for peroxyl radicals; no T dependence obs.	61A003

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ (L mol^{-1} s^{-1})	pH	Solvent	T (K)	log $2A$	E_a (kJ mol^{-1})	Method	Comment	Ref.
5.11	**Cyclohexylperoxyl**—Continued									
		2.8×10^6		c-C_6H_{12}	298			p.r.	D.k in oxygen-satd. soln.; calcn. involves product yields and initial peroxyl radical concn. of 3.8×10^{-4} mol L^{-1}.	61A004
5.12	**Methylcyclohexylperoxyl**									
	c-$C_6H_{10}(CH_3)OO\cdot$	3.7×10^6		MCH	298		24	p.r.	D.k. (esr) in O_2/Ar satd. soln. of methylcyclohexane; no T range given.	680329
5.13	**Heptylperoxyl**									
	$C_7H_{15}OO\cdot$	9.7×10^5 [298 K]		Heptane		7.46	8.4	f.p.	D.k. (see 5.8); studied at 294-324 K.	79B136
		4.3×10^5 [200 K]		Heptane		7.7	7.9	phot.	From steady-state [ROO·]; at 253 K [ROO·] $= 7.9 \times 10^{-7}$ mol L^{-1}; photolysis rate assumed independent of T; studied at 190-253 K.	707039
		2.2×10^6		Heptane	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.; mostly *sec*-alkylperoxyl radicals.	680329
5.14	**1,1,2,2-Tetramethylpropylperoxyl**									
	$(CH_3)_3CC(CH_3)_2OO\cdot$	5.0×10^3 [298 K]		2,2,3-Trimethyl-butane		9.2	31.4	phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.5% DTBP; measured decay due primarily to *tert*-peroxyl radicals; above 293 K decay of primary radicals interferes; studied at 243-293 K.	707039
5.15	**Cycloheptylperoxyl**									
	c-$C_7H_{13}OO\cdot$	8.6×10^6		c-C_7H_{14}	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.	680329
5.16	**Octylperoxyl**									
	$C_8H_{17}OO\cdot$	9.7×10^5 [298 K]		Octane		7.46	8.4	f.p.	D.k. (see 5.8); studied at 283-356 K.	79B136
		7.6×10^6		Octane	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.; mostly *sec*-alkylperoxyl radicals.	680329
5.17	**Cyclooctylperoxyl**									
	c-$C_8H_{15}OO\cdot$	1.4×10^7		c-C_8H_{16}	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.	680329
5.18	**Peroxyl radical from octene**									
	$C_8H_{15}OO\cdot$	$\sim 1 \times 10^7$		1-Octene	RT			p.r.	D.k. in oxygen-satd. soln.; calcn. involves product yields and initial peroxyl radical concn. of 1.3×10^{-4} mol L^{-1}.	61A004
5.19	**Nonylperoxyl**									
	$C_9H_{19}OO\cdot$	9.7×10^5 [298 K]		Nonane		7.46	8.4	f.p.	D.k. (see 5.8); studied at 283-324 K.	79B136

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ (L mol^{-1} s^{-1})	pH	Solvent	T (K)	log $2A$	E_a (kJ mol^{-1})	Method	Comment	Ref.
5.19	**Nonylperoxyl**—Continued									
		2.2×10^6		Nonane	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.; mostly *sec*-alkylperoxyl radicals.	680329
5.20	**Decylperoxyl**									
	$C_{10}H_{21}OO\cdot$	9.7×10^5 [298 K]		Decane		7.46	8.4	f.p.	D.k. (see 5.8); studied at 283-355 K.	79B136
		3.0×10^6		Decane	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.; mostly *sec*-alkylperoxyl radicals.	680329
5.21	**Cyclododecylperoxyl**									
	c-$C_{12}H_{23}OO\cdot$	5.7×10^6 [298 K]		c-$C_{12}H_{24}$		8.12	7.8	p.r.	D.k. at 275 nm in oxygen-satd. soln.; ϵ cor. to 1000 L mol^{-1} cm^{-1}; studied at 345-417 K.	84A401
5.22	**Dodecylperoxyl**									
	$C_{12}H_{25}OO\cdot$	9.7×10^5 [298 K]		Dodecane		7.46	8.4	f.p.	D.k. (see 5.8); studied at 284-355 K.	79B136
		6.2×10^6 [298 K]		Dodecane		8.16	7.8	p.r.	D.k. at 270 nm in O_2/Ar satd. soln.; ϵ cor. to 1000 L mol^{-1} cm^{-1}; studied at 275-413 K.	84A401
5.23	**Tridecylperoxyl**									
	$C_{13}H_{27}OO\cdot$	1.7×10^6		Benzene	300			f.p.	D.k. at 300 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP and 0.1 mol L^{-1} tridecane; ϵ = 800 L mol^{-1} cm^{-1}.	85A466
		9.7×10^5 [298 K]		Tridecane		7.46	8.4	f.p.	D.k. (see 5.8); studied at 293-358 K.	79B136
		1.6×10^6		Tridecane	298			p.r.	D.k. (esr) in O_2/Ar satd. soln.; mostly *sec*-alkylperoxyl radicals.	680329
5.24	**2,4,6,8-Tetramethylnonylperoxyl**									
	$C_{13}H_{27}OO\cdot$	2.2×10^5 [298 K]		DTBP/TMN		13.41	46	phot.	D.k. (esr) in air-satd. soln. contg. DTBP and 2,4,6,8-tetramethylnonane (TMN) (2:1 v/v); radical concn. detd. by double integration and comparison with DPPH; studied at 243-293 K.	86A360
5.25	**2,4,6,8-Tetramethylnonenylperoxyl**									
	$C_{13}H_{25}O_2\cdot$	3×10^6 [298 K]		DTBP/TMN		10.2	21	phot.	D.k. (esr) in air-satd. soln. contg. DTBP and 2,4,6,8-tetramethylnonene (TMN) (2:1 v/v); radical concn. detd. by double integration and comparison with DPPH; studied at 243-293 K.	86A360
5.26	**Hexadecylperoxyl**									
	$C_{16}H_{33}OO\cdot$	9.7×10^5 [298 K]		Hexadecane		7.46	8.4	f.p.	D.k. (see 5.8); studied at 293-351 K.	79B136

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.27	**Peroxyl radicals from polypropylene**									
	PPOO·	6.4×10^5 [298 K]		Benzene		16.32	60	phot.	D.k. (esr) in air-satd. soln. contg. DTBP and polypropylene (2:1 v/v); radical concn. detd. by double integration and comparison with DPPH; studied at 263-303 K	86A360
5.28	**Hydroxymethylperoxyl**									
	$HOCH_2OO$·	2.1×10^9	5.1	Water	RT			p.r.	Buildup of condy. in N_2O/O_2 (4:1 v/v) satd. soln. contg. 0.1 mol L^{-1} MeOH and perchloric acid; no change in k with CD_3OH.	78A231
		3×10^6	3	Water	296			p.r.	Mixed order, includes $k = 5 \times 10^3\ s^{-1}$; effect of changing pulse intensity, obs. at 290 nm in N_2O/O_2 (1:1) satd soln. contg. 0.1 mol L^{-1} MeOH; $\epsilon = 500\ L\ mol^{-1}\ cm^{-1}$.	761081
5.29	**1-Hydroxyethylperoxyl**									
	$CH_3CH(OH)OO$·	7×10^8	6.8	Water	293			p.r.	Buildup of condy. in N_2O/O_2 (4:1 v/v) satd. soln. contg. 0.1 mol L^{-1} EtOH.	83A056
		1.2×10^8		Ethanol	RT			p.r.	D.k. at 290 nm in oxygen-satd. soln.; radical concn. for $[CH_3\dot{C}HOH]$ used; uncertain whether k or $2k$.	65A004
5.30	**2-Hydroxyethylperoxyl**									
	$HOCH_2CH_2OO$·	2.0×10^8	~6	Water	RT			p.r.	Obs. increase in condy. in N_2O/O_2 satd. soln. contg. ethylene; G(acid) = 0.9.	84A313
5.31	**1-Hydroxy-1-methylethylperoxyl**									
	$(CH_3)_2C(OH)OO$·	1.1×10^7	3	Water	296			p.r.	Mixed order, includes $k = 550\ s^{-1}$; effect of changing pulse intensity, obs. at 290 nm in N_2O/O_2 (1:1) satd. soln. contg. 2-PrOH; $\epsilon = 500\ L\ mol^{-1}\ cm^{-1}$; similar results at 248 nm.	761081
5.32	**2-Hydroxy-2,2-dimethylethylperoxyl**									
	$(CH_3)_2C(OH)CH_2OO$·	8×10^8	9.4	Water	293			p.r.	Obs. condy. decrease in N_2O/O_2 (4:1 v/v) satd. soln. contg. 0.01 mol L^{-1} *tert*-BuOH; $G(O_2^-) = 1.7$, G(ROO·) = 5.4; $k = 6 \times 10^8$ for the radical from *tert*-BuOH-d_9 at pH 9.1.	79G027

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.32	**2-Hydroxy-2,2-dimethylethylperoxyl**—Continued									
		1.8×10^8	~7	Water	RT			p.r.	D.k. in in N_2O/O_2 satd. soln. contg. 0.01 mol L^{-1} *tert*-BuOH; $\epsilon = 1350$ L mol^{-1} cm^{-1} at max. (~250 nm).	79A295
5.33	**Hydroxycyclopentylperoxyl**									
	$c\text{-}C_5H_8(OH)OO\cdot$	2×10^8	6.8	Water	RT			p.r.	Obs. condy. increase (with dose rate) in N_2O/O_2 (4:1 v/v) satd. soln. contg. cyclopentanol; cor. for HO_2 elimination.	87A250
5.34	**Hydroxycyclohexylperoxyl**									
	$c\text{-}C_6H_{10}(OH)OO\cdot$	7×10^7	6.8	Water	RT			p.r.	Obs. condy. increase (with dose rate) in N_2O/O_2 (4:1 v/v) satd. soln. contg. cyclohexanol; cor. for HO_2 elimination.	87A250
		1.2×10^7		$c\text{-}C_6H_{11}OH$	295			p.r.	D.k. at 250-80 nm in oxygen-satd. soln. contg. cyclohexanol; ϵ(246 nm) = 1600 L mol^{-1} cm^{-1}.	710136
		1.8×10^7		$c\text{-}C_6H_{11}OH$	298			p.r.	D.k. at 302 nm in oxygen-satd. soln.; calcn. involves product yields to derive initial radical concn. = 5×10^{-4} mol L^{-1}.	61A004
5.35	**Hydroxycyclohexadienylperoxyl**									
	$HOC_6H_6OO\cdot$	9.3×10^8		Water				p.r.	D.k. at 310 nm in N_2O/O_2 satd. soln. contg. benzene; $\epsilon = 690$ L mol^{-1} cm^{-1}; uncertain whether k or $2k$.	761212
5.36	**1-Hydroxy-1,7,7-trimethylbicyclo[2.2.1]heptylperoxyl**									
	$C_{10}H_{16}(OH)OO\cdot$	3.4×10^8		Water	RT			p.r.	D.k. at 260 nm in N_2O-satd. soln. contg. 10^{-3} mol L^{-1} camphor and traces of oxygen; $\epsilon =$ 1060 L mol^{-1} cm^{-1}.	79A191
5.37	**1,3-Dihydroxycyclopentylperoxyl**									
	$c\text{-}C_5H_7(OH)_2OO\cdot$	3×10^8	6.8	Water	RT			p.r.	Obs. condy. increase (with dose rate) in N_2O/O_2 (4:1 v/v) satd. soln. contg. 1,3-cyclopentanediol; mixed radicals; cor. for HO_2 elimination.	87A250
5.38	**1,2-Dihydroxycyclohexylperoxyl**									
	$c\text{-}C_6H_9(OH)_2OO\cdot$	2×10^8	6.8	Water	RT			p.r.	Obs. condy. increase (with dose rate) in N_2O/O_2 (4:1 v/v) satd. soln. contg. 1,2-cyclohexanediol; mixed radicals; cor. for HO_2 elimination.	87A250

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.39	**1,3-Dihydroxycyclohexylperoxyl**									
	c-$C_6H_9(OH)_2OO\cdot$	2×10^8	6.8	Water	RT			p.r.	Obs. condy. increase (with dose rate) in N_2O/O_2 (4:1 v/v) satd. soln. contg. 1,3-cyclohexanediol; mixed radicals; cor. for HO_2 elimination.	87A250
5.40	**1,4-Dihydroxycyclohexylperoxyl**									
	c-$C_6H_9(OH)_2OO\cdot$	3×10^8	6.8	Water	RT			p.r.	Obs. condy. increase (with dose rate) in N_2O/O_2 (4:1 v/v) satd. soln. contg. 1,4-cyclohexanediol; mixed radicals; cor. for HO_2 elimination.	87A250
5.41	**1-Ethoxyethylperoxyl**									
	$CH_3CH_2OCH(CH_3)OO\cdot$	4.4×10^9	6	Water	RT			p.r.	Condy. buildup in N_2O/O_2 satd. soln. contg. ethyl ether.	700039
		1.7×10^9	9.8	Water	RT			p.r.	Second-order condy. decrease in N_2O/O_2 satd. soln. contg. 10^{-3} mol L^{-1} Et_2O; conducting species believed to be H^+ and O_2^-; $G(H^+ + O_2^-) = 1.9$.	82G045
5.42	**Isopropoxy(dimethyl)methylperoxyl**									
	$(CH_3)_2CHOC(CH_3)_2OO\cdot$	$\sim 5 \times 10^7$	6.5	Water	RT			p.r.	Computer simulation; mostly cross reactions with other peroxyl radicals; oxygen-satd. soln. contg. 10^{-3} mol L^{-1} diisopropyl ether; results suggest that $k \sim 10^7$ for self-reaction for *tert*-radicals, 8×10^8 for primary radicals and 8×10^7 for cross reactions; 78% *tert*-radicals, 22% primary radicals.	87G038
5.43	**2-Oxopropylperoxyl**									
	$CH_3COCH_2OO\cdot$	8×10^8		Water	RT			p.r.	D.k. at 300 nm in N_2O/O_2 (4:1 v/v) satd. 5×10^{-3} mol L^{-1} acetone soln.; $\epsilon \sim 550$ L $mol^{-1}\ cm^{-1}$ from plot.	86A285
5.44	**Peroxyl radicals from 2,6,8-trimethylnonan-4-one**									
	ROO·	2.7×10^6 [298 K]		DTBP/TMN		14.15	44	phot.	D.k. (esr) in air-satd. soln. contg. DTBP and TMN (2,6,8-trimethylnonan-4-one) (2:1 v/v); radical concn. detd. by double integration and comparison with DPPH; studied at 243-293 K.	86A360

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.45	**Carboxymethylperoxyl, anion**									
	$\cdot OOCH_2CO_2^-$	1.4×10^8	8-10	Water	RT			p.r.	D.k. at 280 nm ($\epsilon = 730$ L mol^{-1} cm^{-1}) in N_2O/O_2 (4:1 v/v) satd. soln. contg. 10^{-2} mol L^{-1} Na acetate; pK_a ($\cdot OOCH_2CO_2H$) = 2.1 [89C014].	85A106
		7.0×10^8	acid	Water	RT			p.r.	D.k. at 310 nm in oxygen-satd. soln. contg. 0.5 mol L^{-1} acetic acid and $HClO_4$; ϵ not given.	84A270
		6.5×10^8 6.5×10^8 4×10^8	5.7 8.2 10.5	Water	RT			p.r.	D.k. in N_2O/O_2 (3:1) satd. soln. contg. 0.01 mol L^{-1} acetate; ϵ(340 nm) = 360 L mol^{-1} cm^{-1}.	761082
		5.6×10^8	8	Water	RT			p.r.	D.k. at 290 nm ($\epsilon = 900$ L mol^{-1} cm^{-1}) in N_2O/O_2 (3:7) satd. soln. contg. 0.1 mol L^{-1} acetate.	761207
5.46	**Acetoxymethylperoxyl**									
	$AcOCH_2OO\cdot$	3.3×10^8		Methyl acetate	293-323		<10	f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 5×10^{-3} mol L^{-1} *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}.	84A098
		2.9×10^9	6.4	Water	RT			p.r.	D.k. at 260 nm in N_2O/O_2 (4:1) satd. soln. contg. methyl acetate; ϵ = 1300 L mol^{-1} cm^{-1}.	78A402
5.47	**1-Acetoxyethylperoxyl**									
	$AcOCH(CH_3)OO\cdot$	3.8×10^8		Ethyl acetate	293-343		<10	f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 5×10^{-3} mol L^{-1} *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}.	84A098
5.48	**1-Acetoxypropylperoxyl**									
	$AcOCH(C_2H_5)OO\cdot$	8×10^7		Propyl acetate	293-343		<10	f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 5×10^{-3} mol L^{-1} *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}.	84A098
5.49	**1-Acetoxy-1-methylethylperoxyl**									
	$AcOC(CH_3)_2OO\cdot$	1.6×10^8		Isopropyl acetate	293-343		<10	f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 5×10^{-3} mol L^{-1} *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent.	84A098
		2.0×10^8		Isopropyl acetate	293-343		<10	f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent.	84A098

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ (L mol^{-1} s^{-1})	pH	Solvent	T (K)	log $2A$	E_a (kJ mol^{-1})	Method	Comment	Ref.
5.50	**Acetoxybutylperoxyl**									
	$AcOCH(C_3H_7)OO\cdot$	1×10^7		Butyl acetate	293-343		<10	f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 5 $\times 10^{-3}$ mol L^{-1} *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent.	84A098
5.51	**Acetoxypentylperoxyl**									
	$AcOCH(C_4H_9)OO\cdot$	7×10^6		Pentyl acetate	293-343		<10	f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 5 $\times 10^{-3}$ mol L^{-1} *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent.	84A098
		1.7×10^7		Pentyl acetate	293-343			f.p.	D.k. at 270-280 nm in air-satd. soln. contg. 5 $\times 10^{-3}$ mol L^{-1} *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent.	84A098
5.52	**Acetoxy(phenyl)methylperoxyl**									
	$AcOCH(C_6H_5)OO\cdot$	5.1×10^8		Benzyl acetate	296			f.p.	D.k. at 300 nm; radical initiation by *DTBP*; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent; k influenced by diffusion rate.	87A292
5.53	**(Ethoxycarbonyl)valeratoethylperoxyl**									
	$EtOCO(CH_2)_4CO_2CH(Me)OO\cdot$	9.1×10^8 [298 K]		Diethyl adipate		11.5	14.5	f.p.	D.k. at 275 nm; radical initiation by *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent; k influenced by diffusion rate; studied at 257-296 K.	87A292
5.54	**1,2-Diacetoxyethylperoxyl**									
	$AcOCH_2CH(OAc)OO\cdot$	8.3×10^8		Ethylene glycol diacetate	296			f.p.	D.k. at 310 nm; radical initiation by *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent; k influenced by diffusion rate.	87A292
5.55	**1,3-Diacetoxy-2,2-dimethylpropylperoxyl**									
	$AcOCH_2C(Me)_2CH(OAc)OO\cdot$	9×10^8 [298 K]		DMPDA		10.2	7.1	f.p.	D.k. at 290 nm; radical initiation by DTBP; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent; DMPDA = 2,2-dimethyl-1,3-propanediol diacetate; k influenced by diffusion rate; studied at 296-338 K.	87A292

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.55	**1,3-Diacetoxy-2,2-dimethylpropylperoxyl**—Continued									
		1.6×10^9 [298 K]		Benzene		10.9	9.6	f.p.	D.k. at 290 nm in oxygen-satd. soln. contg. 1.1×10^{-2} mol L^{-1} DTBP and 0.53 mol L^{-1} 2,2-dimethyl-1,3-propanediol diacetate; studied at 296-338 K; ϵ = 1000 L mol^{-1} cm^{-1}.	87A442
5.56	**1,3-Dipropanoato-2,2-dimethylpropylperoxyl**									
	$RCH_2C(Me)_2CH(R)OO\cdot$ ($R = EtCO_2$)	6.7×10^8 [298 K]		DMPDP		11.7	16.4	f.p.	D.k. at 345 nm; radical initiation by *tert*-butyl hypochlorite; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent; DMPDP = 2,2-dimethyl-1,3-propanediol dipropionate; k influenced by diffusion rate; studied at 296-338 K.	87A292
		2.5×10^9 [298 K]		Benzene		12.5	17.7	f.p.	D.k. at 310 nm in oxygen-satd. soln. contg. 1.1×10^{-2} mol L^{-1} DTBP and 0.59 mol L^{-1} 2,2-dimethyl-1,3-propanediol dipropionate; studied at 296-338 K; ϵ = 1000 L mol^{-1} cm^{-1}.	87A442
5.57	**1,2,2-Triacetoxy-2-ethylbutylperoxyl**									
	$(AcOCH_2)_2C(Et)CH(OAc)OO\cdot$	2.4×10^8 [298 K]		Erythrol triacetate		13.7	30.3	f.p.	D.k. at 320 nm; radical initiation by DTBP; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent; k limited by diffusion rate; studied at 296-343 K.	87A292
		2.8×10^9 [298 K]		Benzene		10.4	5.5	f.p.	D.k. at 295 nm in oxygen-satd. soln. contg. 1.1×10^{-2} mol L^{-1} DTBP and 0.67 mol L^{-1} erythrol triacetate; studied at 296-338 K; ϵ = 1000 L mol^{-1} cm^{-1}.	87A442
5.58	**1,1,1-Triacetoxymethyl-2-acetoxyethylperoxyl**									
	$(AcOCH_2)_3CCH(OAc)OO\cdot$	5.4×10^9 [298 K]		Benzene		10.7	5.5	f.p.	D.k. at 295 nm in oxygen-satd. soln. contg. 1.1×10^{-2} mol L^{-1} DTBP and 0.46 mol L^{-1} pentaerythritol tetraacetate; studied at 296-338 K; ϵ = 1000 L mol^{-1} cm^{-1}.	87A442
5.59	**1,1,1-Tri(propionatomethyl)-2-propionatoethylperoxyl**									
	$(EtCO_2CH_2)_3CCH(O_2CEt)OO\cdot$	7.5×10^8		Pentaerythritol tetrapropionate	313			f.p.	D.k. at 300 nm; radical initiation by DTBP; ϵ = 1000 L mol^{-1} cm^{-1}; mixture of radicals from solvent; k limited by diffusion rate.	87A292

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.59	**1,1,1-Tri(propionatomethyl)-2-propionatoethylperoxyl**—Continued									
		2.2×10^9		Benzene		9.6	~0	f.p.	D.k. at 295 nm in oxygen-satd. soln. contg. 1.1×10^{-2} mol L^{-1} DTBP and 0.20 mol L^{-1} pentaerythritol tetrapropionate; studied at 296-338 K; $\epsilon = 1000$ L $mol^{-1}\ cm^{-1}$.	87A442
5.60	**1,1,1-Tri(valeratomethyl)-2-valeratoethylperoxyl**									
	$(BuCO_2CH_2)_3CCH(O_2CBu)OO$	1.3×10^8 [298 K]		Pentaerythritol tetravalerate		12.9	27.4	f.p.	D.k. at 305 nm; radical initiation by *tert* butyl hypochlorite; $\epsilon = 1000$ L $mol^{-1}\ cm^{-1}$; mixture of radicals from solvent; k limited by diffusion rate; studied at 296-338 K.	87A292
		1.4×10^9 [298 K]		Benzene		9.2	~0	f.p.	D.k. at 290 nm in oxygen-satd. soln. contg. 1.1×10^{-2} mol L^{-1} DTBP and 0.26 mol L^{-1} pentaerythritol tetravalerate; studied at 296-338 K; $\epsilon = 1000$ L $mol^{-1}\ cm^{-1}$.	87A442
		3.2×10^9 [298 K]		C_8F_{18}		11.9	13.9	f.p.	D.k. at 265 nm in oxygen-satd. soln. contg. 1×10^{-3} mol L^{-1} Cl_2 and 0.01 mol L^{-1} pentaerythritol tetravalerate; studied at 296-338 K; $\epsilon = 1000$ L $mol^{-1}\ cm^{-1}$.	87A442
5.61	**1,1,1-Tribenzoatomethyl-2-benzoatoethylperoxyl**									
	$(BzOCH_2)_3CCH(OBz)OO\cdot$	~3×10^9 [298 K]		Benzene		~10.8	~6.0	f.p.	D.k. at 310 nm in oxygen-satd. soln. contg. 1.1×10^{-2} mol L^{-1} DTBP and 0.12 mol L^{-1} pentaerythritol tetrabenzoate; studied at 296-338 K; $\epsilon = 1000$ L $mol^{-1}\ cm^{-1}$.	87A442
5.62	**Dimethylphosphatomethylperoxyl**									
	$(CH_3O)_2PO_2CH_2OO\cdot$	9×10^8	6.5, 10-11	Water	RT			p.r.	P.b.k.; increase in condy. in N_2O/O_2 (4:1 v/v) satd. soln. contg. trimethyl phosphate.	84A088
5.63	**Perfluoropolyetherperoxyl from photooxid. of C_2F_4**									
	$R_FOCF_2OO\cdot$	6.7×10^7		n-C_6F_{14}	223			phot.	D.k. (esr)	88A416
		4.6×10^6		self	223		36	phot.	D.k. (esr)	88A416
5.64	**Perfluoropolyetherperoxyl from photooxid. of C_3F_6**									
	$R_FOCF(CF_3)OO\cdot$	4.2×10^3		self	223		75	phot.	D.k. (esr)	88A416
5.65	**Trichloromethylperoxyl**									
	$CCl_3OO\cdot$	2×10^8		Water/ 2-PrOH	RT			p.r.	D.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4; $\epsilon(310) = 400$ L $mol^{-1}\ cm^{-1}$.	89A019

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ (L mol^{-1} s^{-1})	pH	Solvent	T (K)	log $2A$	E_a (kJ mol^{-1})	Method	Comment	Ref.
5.66	**Peroxyl radicals from linoleate-OH adduct**									
	LH(OH)OO·	2.4×10^7	7.4-9.4	Water	295	10.94	20.1	p.r.	D.k. at 245 nm in N_2O/O_2 (1:1) satd. soln. contg. 1×10^{-4} mol L^{-1} linoleate; $\epsilon = 1600$ L mol^{-1} cm^{-1}	89G044
5.67	**13-Peroxyl radical from linoleate**									
	LOO·	3×10^8	11.5	Water	RT			p.r.	Calcd. from reaction scheme and data from N_2O-satd. soln. contg. 13-hydroperoxylinoleate, azide ion and quercetin or kaempferol, or in N_2O/O_2 satd. linoleate soln.; average.	87A277
5.68	**Peroxyl radicals from linoleate**									
	LOO·	$\sim 2 \times 10^7$	10.5	Water	RT			p.r.	P.b.k. at 270-300 nm.	78A365
5.69	**3β-3-Hydroxycholest-5-en-7-ylperoxyl**									
	ROO·	6.5×10^6 [298 K]		Benzene		9.69	16.5	f.p.	D.k. at 300 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP and 0.1 mol L^{-1} cholesterol; $\epsilon = 800$ L mol^{-1} cm^{-1}; studied at 282-315 K.	85A466
5.70	**3β-3-Hydroxycholestan-7-ylperoxyl**									
	ROO·	6.0×10^5 [298 K]		Benzene		8.66	16.5	f.p.	D.k. at 300 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP and 0.1 mol L^{-1} cholestanol; $\epsilon = 800$ L mol^{-1} cm^{-1}; studied at 282-313 K.	85A466
5.71	**3β-3-Dodecanoyloxycholest-5-en-7-ylperoxyl**									
	ROO·	2.0×10^6 [298 K]		Benzene		9.04	15.7	f.p.	D.k. at 300 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP and 0.1 mol L^{-1} cholesteryl laurate; $\epsilon = 800$ L mol^{-1} cm^{-1}; studied at 281-308 K.	85A466
		4×10^6 [298 K]		Benzene		8.83	13.65	f.p.	D.k. at 300 nm in Ar-satd. soln. contg. di-*tert*-butyl hydroperoxide and cholesteryl laurate hydroperoxide; $\epsilon = 800$ L mol^{-1} cm^{-1}; studied at 282-316 K.	85A466
5.72	**3β-3-Dodecanoyloxycholestan-7-ylperoxyl**									
	ROO·	6×10^5 [298 K]		Benzene		8.27	14.2	f.p.	D.k. at 300 nm in air-satd. soln. contg. 1×10^{-2} mol L^{-1} DTBP and 0.1 mol L^{-1} cholestanyl laurate; $\epsilon = 800$ L mol^{-1} cm^{-1}; studied at 282-310 K.	85A466

TABLE 5. Rate constants for radical-radical reactions of peroxyl radicals—Continued

No.	Radical	$2k$ ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log $2A$	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
5.73	**3,6-Dioxo-2-piperazinylperoxyl**									
	-NHCH(OO·)CONHCH$_2$CO-	7×10^8	<7	Water				p.r.	D.k. in N_2O/O_2 (4:1) satd. soln. contg. glycine anhydride; elimination of O_2^- important in basic soln.	87A490
5.74	**Peroxyl radical of thymine-H adduct**									
	5-MeU(H)OO·	6.0×10^6	6-7	Water	RT			p.r.	D.k. at 270 nm in N_2O/O_2 (1:1) satd. soln. contg. dihydrothymine; ϵ(240 nm) = 1300 L $mol^{-1}\ cm^{-1}$.	741151
5.75	**Peroxyl radical of uracil-H adduct**									
	U(H)OO·	2×10^7	3	Water	RT			p.r.	D.k. at 280 nm in N_2O/O_2 (4:1 v/v) satd. soln. contg. 10^{-3} mol L^{-1} dihydrouracil; 5- and 6-peroxyl radicals present, 6-peroxyl is predominant.	84G025
5.76	**Peroxyl radical of uracil-OH adduct**									
	U(OH)OO·	$\sim 1 \times 10^9$	6.5	Water	RT			p.r.	Condy. buildup in N_2O/O_2 (4:1 v/v) satd. soln. contg. 5×10^{-4} mol L^{-1} uracil from O_2^- formn., suggested to be for the 5-peroxy-6-hydroxy radical; $G(H^+ +$ anion) = 1.1; reaction is approximately second order.	83G100
		$\sim 2 \times 10^8$	7	Water	RT			p.r.	D.k. in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} uracil; ϵ(300 nm) = 280 L $mol^{-1}\ cm^{-1}$.	710256

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.1	**Methylperoxyl**									
6.1.1	**2,3,9,10-Tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraenecobalt(II) ion**									
	$CH_3OO\cdot + Co(tetraeneN_4)^{2+} \rightarrow Co(tetraeneN_4)OOCH_3^{2+}$	1.2×10^8	~3	Water	RT			f.p.	D.k. at 542 nm in air- or oxygen-satd. soln. contg. $1\text{-}2 \times 10^{-5}$ mol L^{-1} $[Co(tetraeneN_4)CH_3]^+$; radical from Co-CH_3 homolysis of complex.	78A001
6.1.2	**Nitrilotriacetatocobalt(II) ion**									
	$CH_3OO\cdot + CoNTA^- \rightarrow NTACoOOCH_3^-$	1.0×10^8	6.3	Water	RT			p.r.	P.b.k. at at 310 nm in soln. contg. $2\text{-}10 \times 10^{-4}$ $CoNTA^-$, 7×10^{-4} mol L^{-1} O_2, 1.1×10^{-2} mol L^{-1} N_2O, and 0.1 mol L^{-1} DMSO.	89A204
6.1.3	**Ascorbate ion**									
	$CH_3OO\cdot + AH^- \rightarrow CH_3OOH + \cdot A^-$	1.8×10^6	7	Water/ DMSO	RT			p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 40% DMSO.	89A165
		1.8×10^6		Water/ 2-PrOH	RT			p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4.	89A019
		1.7×10^6	7	Water	RT			p.r.	P.b.k. at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	86A291
		2.2×10^6	7	Water	RT			p.r.	P.b.k. at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	80A053
6.1.4	**Ascorbic acid**									
	$CH_3OO\cdot + AH_2 \rightarrow CH_3OOH + \cdot A^-$	3×10^5		Water/ DMSO	RT			p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 10% DMSO; k_{obs} at pH 3.1 $= 4 \times 10^6$.	89A165
6.1.5	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**									
	$CH_3OO\cdot + ABTS \rightarrow CH_3OO^- + ABTS\cdot^+$	$<1 \times 10^5$		Water	RT			p.r.	No change in absorption in N_2O/O_2 satd. soln. contg. DMSO.	82A196
6.1.6	**Bilirubin dianion**									
	$CH_3OO\cdot + BR^{2-} \rightarrow CH_3OO^- + BR\cdot^-$	5.7×10^7	11	Water/ *tert*-BuOH	RT			p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CH_3Cl and bilirubin.	89A901
6.1.7	**Hydroquinone**									
	$CH_3OO\cdot + 1,4\text{-}C_6H_4(OH)_2 \rightarrow$	$<1 \times 10^6$	7	Water	RT			p.r.	P.b.k. at 430 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	86A291
6.1.8	**6-Hydroxy-2,5,7,8-tetramethyl-1-benzopyran-2-carboxylic acid**									
	$CH_3OO\cdot + HTxOH \rightarrow$	$<1 \times 10^5$	~4	Water/ DMSO	RT			p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 10% DMSO.	89A384

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	T (K)	log A	E_a (kJ mol^{-1})	Method	Comment	Ref.
6.1	**Methylperoxyl**—Continued									
6.1.9	**5-Hydroxytryptophan, conjugate base**									
	$CH_3OO\cdot$ + 5- OTrpH → CH_3OO^- + ·OTrpH	7.0×10^6	13	Water	RT			p.r.	P.b.k. at 400 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	86A291
6.1.10	**Isobarbiturate ion**									
	$CH_3OO\cdot$ + IBO^- → CH_3OO^- + IBO·	4.7×10^7	13	Water	RT			p.r.	P.b.k. at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	86A291
6.1.11	**Phenoxide ion**									
	$CH_3OO\cdot$ + $C_6H_5O^-$ → CH_3OO^- + $C_6H_5O\cdot$	$<1 \times 10^6$	12	Water	RT			p.r.	P.b.k. at 400 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	80A053
6.1.12	***N,N,N′,N′*-Tetramethyl-*p*-phenylenediamine**									
	$CH_3OO\cdot$ + TMPD → CH_3OO^- + $TMPD^{\cdot+}$	3.7×10^7		Water/ 2-PrOH	RT			p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4.	89A019
		4.3×10^7	8	Water	RT	12.1	27	p.r.	P.b.k. at 565 nm in air-satd. soln. contg. 1 mol L^{-1} DMSO and 0.4-1 $\times$ 10^{-3} mol L^{-1} TMPD; $k_H/k_D = 2.6$; studied at 273-313 K.	89A384 89A165
6.1.13	**Tyrosine, negative ion**									
	$CH_3OO\cdot$ + $TyrO^-$ → CH_3OO^- + TyrO·	$<1 \times 10^6$	12	Water	RT			p.r.	P.b.k. at 400 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	80A053
6.1.14	**Urate ion**									
	$CH_3OO\cdot$ + UrO^- → CH_3OO^- + UrO·	8.8×10^6	13	Water	RT			p.r.	P.b.k. at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	86A291
6.1.15	**Xanthine, negative ion**									
	$CH_3OO\cdot$ + XO^- → CH_3OO^- + XO·	3×10^5	13	Water	RT			p.r.	P.b.k. at 350 nm in N_2O/O_2 (4:1) satd. soln. contg. 1 mol L^{-1} DMSO.	86A291
6.2	**Ethylperoxyl**									
6.2.1	**Bilirubin dianion**									
	$C_2H_5OO\cdot$ + BR^{2-} → $C_2H_5OO^-$ + $BR^{\cdot-}$	4.1×10^7	11	Water/ *tert*-BuOH	RT			p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CH_3CH_2Cl and bilirubin.	89A901
6.2.2	***N,N,N′,N′*-Tetramethyl-*p*-phenylenediamine**									
	$C_2H_5OO\cdot$ + TMPD → C_2H_5OOH + $TMPD^{\cdot+}$ + OH^-	3.3×10^7	~8	Water	RT			p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. diethyl sulfoxide.	89A165

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.3	**2-Propylperoxyl**									
6.3.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**									
	$(CH_3)_2CHOO\cdot$ + TMPD → $(CH_3)_2CHOOH$ + $TMPD^{\cdot+}$ + OH^-	9.2×10^6	~8	Water	RT			p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. diisopropyl sulfoxide.	89A165
6.4	**Butylperoxyl**									
6.4.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**									
	$CH_3(CH_2)_3OO\cdot$ + TMPD → $CH_3(CH_2)_3OOH$ + $TMPD^{\cdot+}$ + OH^-	2.9×10^7	~8	Water	RT			p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. dibutyl sulfoxide.	89A165
6.5	***tert*-Butylperoxyl**									
6.5.1	**Bis(acetylacetonato)cobalt(II)**									
	$(CH_3)_3COO\cdot$ + $Co(acac)_2$ →	4.8×10^3 [200 K]		Toluene		8.9	20	phot.	D.k. (esr) in oxygen- or air-satd. soln. contg. di-*tert*-butyl ketone; studied at 183-213 K.	80A283
6.5.2	**Nickel(II) dibutyldithiocarbamate**									
	$(CH_3)_3COO\cdot$ + $[(C_4H_9)_2NCS_2]_2Ni$ →	$\sim 2 \times 10^4$		$CFCl_3$	179-258			phot.	D.k. (esr) in oxygen-satd. soln. contg. azoisobutane.	76A266
6.5.3	**Phosphorus tribromide**									
	$(CH_3)_3COO\cdot$ + PBr_3 →	4.0×10^0		Isopentane	178			phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane.	737013
6.5.4	**Phosphorus trichloride**									
	$(CH_3)_3COO\cdot$ + PCl_3 →	5.0×10^0		Isopentane	178			phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane.	737013
6.5.5	**Hexaphenyldilead**									
	$(CH_3)_3COO\cdot$ + $[(C_6H_5)_3Pb]_2$ →	9.4×10^2 [200 K]		Cumene		9.5	25	phot.	D.k. (esr) in oxygen-satd. soln. contg. 4-100 $\times 10^{-2}$ mol L^{-1} hexaphenyldilead and azoisobutane; studied at 173-203 K.	72A026
6.5.6	**Hexaphenylditin**									
	$(CH_3)_3COO\cdot$ + $[(C_6H_5)_3Sn]_2$ →	2.1×10^1 [200 K]		Cumene		5.5	16	phot.	D.k. (esr) in oxygen-satd. soln. contg. 4-100 $\times 10^{-2}$ mol L^{-1} hexaphenylditin and azoisobutane; studied at 173-203 K.	72A026
6.5.7	**Bis(acetylacetonato)oxovanadium(IV)**									
	$(CH_3)_3COO\cdot$ + $VO(acac)_2$ → $(CH_3)_3COO^-$ + $VO(acac)_2^+$	3.1×10^4 [200 K]		Toluene		6.0	5.8		D.k. (esr) in air-satd. soln. contg. 2.5 or 8.6 $\times 10^{-5}$ mol L^{-1} $VO(acac)_2$ and azoisobutane or di-*tert*-butyl ketone; studied at 178-208 K.	81A202
6.5.8	**Zinc(II) diisopropyldithiophosphate**									
	$(CH_3)_3COO\cdot$ + $Zn[[(CH_3)_2CHO]_2PS_2]_2$ →	4.4×10^1 [200 K]		Isobutane		6.0	16.7	phot.	D.k. (esr); studied at 183-273 K.	739058

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.5	***tert*-Butylperoxyl**—Continued									
6.5.9	**Zinc(II) di-*sec*-butyldithiophosphate**									
	$(CH_3)_3COO\cdot$ + $Zn[[CH_3CH_2CH(CH_3)O]_2PS_2]_2$ →	3.4×10^1 [200 K]		Isobutane		6.0	17.1	phot.	D.k. (esr); studied at 183-273 K.	739058
6.5.10	**Zinc(II) diisobutyldithiophosphate**									
	$(CH_3)_3COO\cdot$ + $Zn[[(CH_3)_2CHCH_2O]_2PS_2]_2$ →	4.3×10^1 [200 K]		Isobutane		6.1	17.1	phot.	D.k. (esr); studied at 183-273 K.	739058
6.5.11	**Zinc(II) isopropylxanthate**									
	$(CH_3)_3COO\cdot$ + $Zn[(CH_3)_2CHOCS_2]_2$ →	1.1×10^3 [200 K]		Isobutane		7.2	15.9	phot.	D.k. (esr); studied at 170-220 K.	739058
6.5.12	**Aniline**									
	$(CH_3)_3COO\cdot + C_6H_5NH_2$ → $(CH_3)_3COOH + C_6H_5\dot{N}H$	1.4×10^1 [200 K]		Isopentane		6.6	20.9	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5-10% *tert*-butyl peroxide; same k for 1,1-dimethylpropylperoxyl; studied at 183-243 K.	745265
6.5.13	***sec*-Butyl hydroperoxide**									
	$(CH_3)_3COO\cdot$ + $CH_3CH_2CH(CH_3)O_2H$ →	4.9×10^2		Isopentane	294			phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.02 mol L^{-1} 2,2'-azoisobutane.	757053
6.5.14	**4-(*tert*-Butyl)phenol**									
	$(CH_3)_3COO\cdot$ + $(CH_3)_3CC_6H_4OH$ → $(CH_3)_3COOH$ + $(CH_3)_3CC_6H_4O\cdot$	1.8×10^3 [200 K]		Heptane		7.7	17	phot.	D.k. (esr); soln. contg. (1-7) $\times 10^{-2}$ mol L^{-1} *tert*-butyl hydroperoxide; studied at 209-241 K.	81A392
6.5.15	**Chlorodiphenylphosphine**									
	$(CH_3)_3COO\cdot + (C_6H_5)_2PCl$ →	2.6×10^1 [200 K]		Isopentane		3.7	5.4	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013
6.5.16	**1,4-Diazabicyclo[2.2.2]octane**									
	$(CH_3)_3COO\cdot$ + DABCO → $(CH_3)_3COOH$ + DABCO(-H)	4.8×10^0		3-MP	303			phot.	D.k. (esr) in oxygen-satd. soln. contg. di-*tert*-butyl ketone and 0.02-0.2 mol L^{-1} DABCO.	81A016
6.5.17	**2,6-Di-*tert*-butyl-4-carbo-*tert*-butoxyphenol**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	2.0×10^2 [200 K]		Isopentane		3.8	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 172-233 K.	737428
6.5.18	**2,6-Di-*tert*-butyl-4-chlorophenol**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	5.6×10^3 [200 K]		Isopentane		4.3	2.1	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 174-236 K.	737428
6.5.19	***O*-*d*-2,6-Di-*tert*-butyl-4-chlorophenol**									
	$(CH_3)_3COO\cdot$ + ArOD → $(CH_3)_3COOD$ + ArO·	8.1×10^2 [200 K]		Isopentane		5.1	8.4	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 174-235 K.	737428

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.5	***tert*-Butylperoxyl—Continued**									
6.5.20	**2,6-Di-*tert*-butyl-4-cyanophenol**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	8.0×10^2 [200 K]		Isopentane		4.0	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 175-236 K.	737428
6.5.21	***O*-*d*-2,6-Di-*tert*-butyl-4-cyanophenol**									
	$(CH_3)_3COO\cdot$ + ArOD → $(CH_3)_3COOD$ + ArO·	1×10^2 3×10^1		Isopentane	239 176			phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane.	737428
6.5.22	**3,5-Di-*tert*-butyl-4-hydroxybenzaldehyde**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	6.9×10^2 [200 K]		Isopentane		3.7	3.3	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 177-237 K.	737428
6.5.23	**3,5-Di-*tert*-butyl-4-hydroxybenzoic acid**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	5.1×10^2 [200 K]		Isopentane		3.8	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane. studied at 177-237 K.	737428
6.5.24	**2,6-Di-*tert*-butyl-4-methoxyphenol**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	1.1×10^5		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
		1.8×10^4 [200 K]		Isopentane		4.7	1.7	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane. studied at 175-237 K.	737428
6.5.25	***O*-*d*-2,6-Di-*tert*-butyl-4-methoxyphenol**									
	$(CH_3)_3COO\cdot$ + ArOD → $(CH_3)_3COOD$ + ArO·	1.4×10^3 [200 K]		Isopentane		3.7	2.1	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 176-235 K.	737428
6.5.26	**2,6-Di-*tert*-butyl-4-methylphenol**									
	$(CH_3)_3COO\cdot$ + DTBMPhOH → $(CH_3)_3COOH$ + DTBMPhO·	2.4×10^4		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
		5.4×10^3 [200 K]		Isopentane		4.6	3.3	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 173-241 K.	737428
6.5.27	***O*-*d*-2,6-Di-*tert*-butyl-4-methylphenol**									
	$(CH_3)_3COO\cdot$ + DTBMPhOD → $(CH_3)_3COOD$ + DTBMPhO·	4.6×10^2 [200 K]		Isopentane		4.2	5.9	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 175-251 K.	737428
6.5.28	**2,6-Di-*tert*-butylphenol**									
	$(CH_3)_3COO\cdot$ + $[(CH_3)_3C]_2C_6H_3OH$ → $(CH_3)_3COOH$ + $[(CH_3)_3C]C_6H_3O\cdot$	1.6×10^3 [200 K]		Isopentane		4.3	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 175-237 K.	737428
6.5.29	***O*-*d*-2,6-Di-*tert*-butylphenol**									
	$(CH_3)_3COO\cdot$ + $[(CH_3)_3C]_2C_6H_3OD$ → $(CH_3)_3COOD$ + $[(CH_3)_3C]C_6H_3O\cdot$	9.9×10^1 [200 K]		Isopentane		3.3	5.0	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 178-237 K.	737428

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.5	***tert*-Butylperoxyl—Continued**									
6.5.30	***N,N*-Diethylaniline**									
	$(CH_3)_3COO\cdot + C_6H_5N(C_2H_5)_2 \rightarrow (CH_3)_3COOH + C_6H_5N(C_2H_5)\dot{C}HCH_3$	4.8×10^1		3-MP	303			phot.	D.k. (esr) in oxygen-satd. soln. contg. di-*tert*-butyl ketone and 0.02-0.2 mol L^{-1} amine	81A016
6.5.31	**9,10-Dihydro-9-anthracenyl hydroperoxide**									
	$(CH_3)_3COO\cdot + AnO_2H \rightarrow$	7.4×10^2		Isopentane	294			phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.02 mol L^{-1} 2,2'-azoisobutane.	757053
6.5.32	**3,4-Dihydro-6-hydroxy-5,7,8-trimethylbenzothiopyran**									
	$(CH_3)_3COO\cdot + ArOH \rightarrow (CH_3)_3COOH + ArO\cdot$	1.8×10^6		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
6.5.33	**Diphenylphosphine**									
	$(CH_3)_3COO\cdot + (C_6H_5)_2PH$	1.8×10^2 [200 K]		Isopentane		5.0	10.5	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013
6.5.34	**1-Ethyl-1,2,3,4-tetrahydro-6-hydroxy-5,7,8-trimethylquinoline**									
	$(CH_3)_3COO\cdot + ArOH \rightarrow (CH_3)_3COOH + ArO\cdot$	2.0×10^6		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
6.5.35	**6-Hydroxy-2,2,5,7,8-pentamethylchromene**									
	$(CH_3)_3COO\cdot + ArOH \rightarrow (CH_3)_3COOH + ArO\cdot$	2.0×10^6		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
6.5.36	**2-Methoxy-1,3,2-dioxaphospholane**									
	$(CH_3)_3COO\cdot + -CH_2OP(OCH_3)OCH_2- \rightarrow$	1.1×10^1 [200 K]		Isopentane		6.0	19	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane studied at 173-243 K.	737013
6.5.37	**Methoxydiphenylphosphine**									
	$(CH_3)_3COO\cdot + (C_6H_5)_2POCH_3 \rightarrow$	1.9×10^2 [200 K]		Isopentane		3.7	5.4	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013
6.5.38	**4-Methoxy-2,3,5,6-tetramethylphenol**									
	$(CH_3)_3COO\cdot + CH_3O(CH_3)_4C_6OH \rightarrow (CH_3)_3COOH + CH_3O(CH_3)_4C_6O\cdot$	2.8×10^5		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
6.5.39	***N*-Methylaniline**									
	$(CH_3)_3COO\cdot + C_6H_5NHCH_3 \rightarrow (CH_3)_3COOH + C_6H_5\dot{N}CH_3$	5.7×10^2 [200 K]		Heptane		5.5	10.5	phot.	D.k. (esr) in soln. contg. *tert*-butyl hydroperoxide (1-7) $\times 10^{-2}$ mol L^{-1}; studied at 198-230 K.	81A392
6.5.40	**Methyldiphenylphosphine**									
	$(CH_3)_3COO\cdot + (C_6H_5)_2PCH_3 \rightarrow$	2.8×10^3 [200 K]		Isopentane		5.1	6.3	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.5	***tert*-Butylperoxyl—Continued**									
6.5.41	**2-Naphthalenethiol**									
	$(CH_3)_3COO\cdot$ + NpSH → $(CH_3)_3COOH$ + NpS·	1.4×10^3 [200 K]		Isopentane		4.8	6.3	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5-10% *tert*-butyl peroxide; same k for 1,1-dimethylpropylperoxyl; studied at 177-313 K.	745265
6.5.42	**1-Naphthylamine**									
	$(CH_3)_3COO\cdot$ + 1-NpNH$_2$ → $(CH_3)_3COOH$ + NpNH	1.3×10^3 [200 K]		Isopentane		4.2	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 189-238 K.	737428
6.5.43	**1-Naphthylamine-*N*-d_2**									
	$(CH_3)_3COO\cdot$ + NpND$_2$ → $(CH_3)_3COOD$ + 1-NpND	8.0×10^1 [200 K]		Isopentane		3.0	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 189-238 K.	737428
6.5.44	**2-Naphthylamine**									
	$(CH_3)_3COO\cdot$ + 2-NpNH$_2$ → $(CH_3)_3COOH$ + NpNH	3.1×10^2 [200 K]		Isopentane		5.0	9.6	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5-10% *tert*-butyl peroxide; same k for 1,1-dimethylpropylperoxyl; studied at 183-243 K.	745265
6.5.45	**1-Naphthol**									
	$(CH_3)_3COO\cdot$ + 1-NpOH → $(CH_3)_3COOH$ + NpO·	3.5×10^4 [200 K]		Isopentane		6.4	7.1	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 158-199 K.	737428
6.5.46	**1-Naphthol-*O*-*d***									
	$(CH_3)_3COO\cdot$ + NpOD → $(CH_3)_3COOD$ + NpO·	2.8×10^3 [200 K]		Isopentane		6.4	11.3	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 168-199 K.	737428
6.5.47	**2-Naphthol**									
	$(CH_3)_3COO\cdot$ + 2-NpOH → $(CH_3)_3COOH$ + NpO·	3.8×10^3 [200 K]		Isopentane		6.4	10.8	phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.01-0.02 mol L^{-1} 2,2'-azoisobutane in isopentane:toluene (90:1 v/v); studied at 183-241 K.	745265
6.5.48	**Phenol**									
	$(CH_3)_3COO\cdot$ + C_6H_5OH → $(CH_3)_3COOH$ + $C_6H_5O\cdot$	3.2×10^1 [200 K]		Isopentane		7.2	21.8	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5-10% *tert*-butyl peroxide; same k for 1,1-dimethylpropylperoxyl; studied at 176-294 K.	745265
6.5.49	***N*-Phenyl-1-naphthylamine**									
	$(CH_3)_3COO\cdot$ + NpNHC$_6$H$_5$ → $(CH_3)_3COOH$ + NpNC$_6$H$_5$	1.0×10^4 [200 K]		Isopentane		5.1	4.2	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 174-235 K.	737428

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.5	***tert*-Butylperoxyl**—Continued									
6.5.50	***N*-Phenyl-1-naphthylamine-*N*-d_1**									
	$(CH_3)_3COO\cdot + NpN\dot{D}C_6H_5 \rightarrow (CH_3)_3COOD + NpN\dot{C}_6H_5$	1.1×10^3 [200 K]		Isopentane		3.8	2.9	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 176-235 K.	737428
6.5.51	**Piperidine**									
	$(CH_3)_3COO\cdot + C_5H_{11}N \rightarrow (CH_3)_3COOH + C_5H_{10}N$	2.1×10^1		3-MP	303			phot.	D.k. (esr) in oxygen-satd. soln. contg. di-*tert*-butyl ketone and 0.02-0.2 mol L^{-1} amine.	81A016
6.5.52	**Propionaldehyde**									
	$(CH_3)_3COO\cdot + C_2H_5CHO \rightarrow$	6.1×10^{-2} [200 K]		Heptane		6.1	28	phot.	D.k. (esr) in soln. contg. *tert*-butyl hydroperoxide (1-7) $\times 10^{-2}$ mol L^{-1}; studied at 209-241 K.	81A392
6.5.53	**Pyrrolidine**									
	$(CH_3)_3COO\cdot + -NH(\dot{C}H_2)_4- \rightarrow (CH_3)_3COOH + -NHC(CH_2)_3-$	3.8×10^2		3-MP	303			phot.	D.k. (esr) in oxygen-satd. soln. contg. di-*tert*-butyl ketone and 0.02-0.2 mol L^{-1} amine.	81A016
6.5.54	**α-Tetralin hydroperoxide**									
	$(CH_3)_3COO\cdot$ + α-T-OOH →	1.2×10^1 [200 K]		Isopentane		6.0	18.8	phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.02 mol L^{-1} 2,2'-azoisobutane; studied at 190-252 K.	757053
6.5.55	**α-Tetralin hydroperoxide, deuterated (OOD)**									
	$(CH_3)_3COO\cdot$ + α-T-OOD →	~0.5 $\sim 2 \times 10^1$ 7.0×10^1		Isopentane	190 239 252			phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.02 mol L^{-1} 2,2'-azoisobutane.	757053
6.5.56	**2,3,5,6-Tetramethylphenol**									
	$(CH_3)_3COO\cdot + (CH_3)_4C_6HOH \rightarrow (CH_3)_3COOH + (CH_3)_4C_6HO\cdot$	6.9×10^4		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
6.5.57	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**									
	$(CH_3)_3COO\cdot$ + TMPD → $(CH_3)_3COOH + TMPD\cdot^+ + OH^-$	1.1×10^6	~8	Water	RT			p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. di-*tert*-butyl sulfoxide.	89A165
6.5.58	**Thiophenol**									
	$(CH_3)_3COO\cdot + C_6H_5SH \rightarrow (CH_3)_3COOH + C_6H_5S\cdot$	2.0×10^3 [200 K]		Isopentane		4.5	4.6	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5-10% *tert*-butyl peroxide; *same k for* 1,1-dimethylpropylperoxyl; studied at 178-233 K.	745265
6.5.59	**α-Tocopherol**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	2.6×10^6		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.5	***tert*-Butylperoxyl—Continued**									
6.5.60	**γ-Tocopherol**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	7.0×10^5		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
6.5.61	**δ-Tocopherol**									
	$(CH_3)_3COO\cdot$ + ArOH → $(CH_3)_3COOH$ + ArO·	3.3×10^5		CP or decane	297			f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
6.5.62	**Triallyl phosphite**									
	$(CH_3)_3COO\cdot$ + $(H_2C{=}CHCH_2O)_3P$ →	4.5×10^1 [200 K]		Isopentane		5.7	15.5	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; studied at 173-243 K.	737013
6.5.63	**2,4,6-Tri-*tert*-butylphenol**									
	$(CH_3)_3COO\cdot$ + $[(CH_3)_3C]_3C_6H_2OH$ → $(CH_3)_3COOH$ + $[(CH_3)_3C]_3C_6H_2O\cdot$	4.5×10^3 [200 K]		Isopentane		4.2	2.1	phot.	D.k. (esr) in oxygen-satd. soln. contg. 2,2'-azoisobutane; studied at 172-236 K.	737428
6.5.64	**Tri(*tert*-butyl) phosphite**									
	$(CH_3)_3COO\cdot$ + $[(CH_3)_3CO]_3P$	5.1×10^{-1} [200 K]		Isopentane		6.3	23	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; studied at 173-243 K.	737013
6.5.65	**Tri(4-chlorophenyl)phosphine**									
	$(CH_3)_3COO\cdot$ + $(ClC_6H_4)_3P$ →	2.3×10^2 [200 K]		Toluene		6.8	17	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013
6.5.66	**Triethylamine**									
	$(CH_3)_3COO\cdot$ + $(C_2H_5)_3N$ → $(CH_3)_3COOH$ + $CH_3CHN(C_2H_5)_2$	2.3×10^1		3-MP	303			phot.	D.k.; oxygen-satd. soln. contg. di-*tert*-butyl ketone and 0.02-0.2 mol L^{-1} amine	81A016
6.5.67	**Triethyl phosphite**									
	$(CH_3)_3COO\cdot$ + $(C_2H_5O)_3P$ →	2.2×10^1 [200 K]		Isopentane		5.0	14	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; studied at 173-243 K.	737013
6.5.68	**Tri(4-fluorophenyl)phosphine**									
	$(CH_3)_3COO\cdot$ + $(FC_6H_4)_3P$ →	1.6×10^1 [200 K]		Toluene		5.9	13	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013
6.5.69	**Triisopropyl phosphite**									
	$(CH_3)_3COO\cdot$ + $[(CH_3)_2CHO]_3P$	3.2×10^1 [200 K]		Isopentane		6.2	18	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; studied at 173-243 K.	737013
6.5.70	**Tri(4-methoxyphenyl)phosphine**									
	$(CH_3)_3COO\cdot$ + $(CH_3OC_6H_4)_3P$	3.2×10^2 [200 K]		Toluene		5.9	13	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.5	***tert*-Butylperoxyl**—Continued									
6.5.71	**Tri(4-methylphenyl)phosphine**									
	$(CH_3)_3COO\cdot + (CH_3C_6H_4)_3P \rightarrow$	1.3×10^2 [200 K]		Toluene		6.3	16	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; T range not given, 173-243 (?).	737013
6.5.72	**Trimethyl phosphite**									
	$(CH_3)_3COO\cdot + (CH_3O)_3P \rightarrow$	3.3×10^1 [200 K]		Isopentane		5.7	16	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; studied at 177.5-226 K.	737013
6.5.73	**Triphenylmethyl hydroperoxide**									
	$(CH_3)_3COO\cdot + (C_6H_5)_3COOH$	7.0×10^2		Isopentane	294			phot.	D.k. (esr) in oxygen-satd. soln. contg. 0.02 mol L^{-1} 2,2'-azoisobutane.	757053
6.5.74	**Triphenylphosphine**									
	$(CH_3)_3COO\cdot + (C_6H_5)_3P \rightarrow$	4.3×10^2 [200 K]		Isopentane		5.9	12.5	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; studied at 153-213 K.	737013
6.5.75	**Triphenyl phosphite**									
	$(CH_3)_3COO\cdot + (C_6H_5O)_3P \rightarrow$	1.2×10^2 [200 K]		Isopentane		7.3	20	phot.	D.k. (esr) in air-satd. soln. contg. 2,2'-azoisobutane; studied at 173-243 K.	737013
6.6	**1,1-Dimethylpropylperoxyl**									
6.6.1	**2-Naphthol**									
	$C_2H_5C(CH_3)_2OO\cdot + 2\text{-NpOH} \rightarrow C_2H_5C(CH_3)_2OOH + NpO\cdot$	3.8×10^3 [200 K]		Isopentane		6.4	10.8	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5-10% *tert*-butyl peroxide; studied at 180-293 K.	745265
6.6.2	**2-Naphthol-*O*-*d***									
	$C_2H_5C(CH_3)_2OO\cdot + 2\text{-NpOD} \rightarrow C_2H_5C(CH_3)_2OOD + NpO\cdot$	2.1×10^2 [200 K]		Isopentane		6.5	16	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5-10% *tert*-butyl peroxide; T range not given.	745265
6.6.3	**α-Tetralin hydroperoxide**									
	$C_2H_5C(CH_3)_2OO\cdot + \alpha\text{-T-OOH}$	1.2×10^1 [200 K]		Isopentane		6.0	18.8	phot.	D.k. (esr) in oxygen-satd. soln. contg. 5% di-*tert*-butyl peroxide; studied at 193-298 K	757053
6.7	**Cyclopentylperoxyl**									
6.7.1	**3,7-Dioctylphenothiazine**									
	$c\text{-}C_5H_9OO\cdot + DOPZH \rightarrow c\text{-}C_5H_9OOH + DOPZ\cdot$	2.1×10^7		CP	RT			p.r.	P.b.k. at 400 and 590 nm in air-satd. soln.	731011
6.7.2	**Phenothiazine**									
	$c\text{-}C_5H_9OO\cdot + PZH \rightarrow c\text{-}C_5H_9OOH + PZ\cdot$	3.4×10^6		CP	RT			p.r.	P.b.k. at 370 and 590 nm in air-satd. soln.: $k_H/k_D = 1.7$.	731011

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.8	**Cyclohexylperoxyl**									
6.8.1	**3-*tert*-Butyl-4-hydroxyanisole**									
	$c\text{-}C_6H_{11}OO\cdot$ + ArOH → $c\text{-}C_6H_{11}OOH$ + ArO·	3.4×10^6		CH	RT			p.r.	P.b.k. in air-satd. soln.	82Z341
6.8.2	**2,6-Di-*tert*-butyl-4-methylphenol**									
	$c\text{-}C_6H_{11}OO\cdot$ + DTBMPhOH → $c\text{-}C_6H_{11}OOH$ + DTBMPhO·	$\sim 1 \times 10^4$		CH	RT			p.r.	P.b.k. in air-satd. soln.	82Z341
6.8.3	**3,7-Dioctylphenothiazine**									
	$c\text{-}C_6H_{11}OO\cdot$ + DOPZH → $c\text{-}C_6H_{11}OOH$ + DOPZ·	2.4×10^7		CH	RT			p.r.	P.b.k. at 380 and 590 nm in air-satd. soln.	731011
6.8.4	**Diphenylamine**									
	$c\text{-}C_6H_{11}OO\cdot$ + $(C_6H_5)_2NH$ → $c\text{-}C_6H_{11}OOH$ + $(C_6H_5)_2\dot{N}$	$\sim 3 \times 10^6$		CH	RT			p.r.	P.b.k. in oxygen-satd. soln.	65A004
6.8.5	***N,N'*-Diphenyl-*p*-phenylenediamine**									
	$c\text{-}C_6H_{11}OO\cdot$ + DPPD → $c\text{-}C_6H_{11}OO^-$ + $DPPD\cdot^+$	$\sim 4 \times 10^7$		CH	RT			p.r.	P.b.k. in oxygen-satd. soln.	65A004
6.8.6	**Phenothiazine**									
	$c\text{-}C_6H_{11}OO\cdot$ + PZH → $c\text{-}C_6H_{11}OOH$ + PZ·	3.9×10^6		CH	RT			p.r.	P.b.k. at 380 and 600 nm in air-satd. soln.	731011
6.8.7	**α-Tocopherol**									
	$c\text{-}C_6H_{11}OO\cdot$ + ArOH → $c\text{-}C_6H_{11}OOH$ + ArO·	7.9×10^6		CH	RT		12	p.r.	P.b.k. in air-satd. soln.; E_a from measurements at 282-300 K.	82A452 82Z341
6.9	**1-Methylcyclohexylperoxyl**									
6.9.1	**4-*tert*-Butyl-*N*-(4-*tert*-butylphenyl)-1-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + R-NpNHAr → $c\text{-}C_6H_{10}(CH_3)OOH$ + R-NpNAr	1.2×10^4 [200 K]		Toluene		6.23	8.3	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.9.2	**4-*tert*-Butyl-*N*-(4-*tert*-butylphenyl)-1-naphthylamine-*N*-oxyl**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + R-NpN(O)Ar →	1.4×10^3		Toluene	253			f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide.	83A241
6.9.3	***N*-*tert*-Butyl-2-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $NpNHC(CH_3)_3$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $NpNC(CH_3)_3$	2.5×10^2 [200 K]		Toluene		4.28	7.2	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.9	**1-Methylcyclohexylperoxyl**—Continued									
6.9.4	***N*-*tert*-Butyl-*N*-hydroxy-2-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $NpN(OH)C(CH_3)_3$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $NpNH(O)C(CH_3)_3$	1.7×10^4		Toluene		5.44	4.6	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.9.5	***N*-(4-*tert*-Butylphenyl)-1-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $NpNHAr$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $NpN\dot{A}r$	8.5×10^3 [200 K]		Toluene		7.74	14.6	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.9.6	***N*-(4-*tert*-Butylphenyl)-1-naphthylamine-*N*-oxyl**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $NpN(\dot{O})Ar$	3.4×10^3		Toluene	253			f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide.	83A241
6.9.7	**3,8-Di-*tert*-butyl-*N*-(4-*tert*-butylphenyl)-1-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $R_2NpNHAr$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $R_2Np\dot{N}Ar$	$1,2 \times 10^4$ [200 K]		Toluene		7.71	13.9	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.9.8	**3,8-Di-*tert*-butyl-*N*-phenyl-1-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $R_2NpNHAr$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $R_2Np\dot{N}Ar$	2.3×10^4 [200 K]		Toluene		7.26	11.1	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.9.9	**3,8-Di-*tert*-butyl-*N*-(4-*tert*-butylphenyl-1-naphthylamine-*N*-oxyl**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $R_2NpN(\dot{O})Ar$ →	3.3×10^3		Toluene	253			f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.9.10	**Diphenylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $(C_6H_5)_2NH$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $(C_6H_5)_2\dot{N}$	9.2×10^2 [200 K]		Toluene		4.66	6.5	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K	83A241

TABLE 6. Rate constants for reactions of alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k ($L\ mol^{-1}\ s^{-1}$)	pH	Solvent	T (K)	log A	E_a ($kJ\ mol^{-1}$)	Method	Comment	Ref.
6.9	**1-Methylcyclohexylperoxyl—Continued**									
6.9.11	***N*-Phenyl-1-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $NpNHC_6H_5$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $NpN\dot{C}_6H_5$	1.5×10^3 [200 K]		Toluene		6.05	11.0	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.9.12	***N*-Phenyl-2-naphthylamine**									
	$c\text{-}C_6H_{10}(CH_3)OO\cdot$ + $NpNHC_6H_5$ → $c\text{-}C_6H_{10}(CH_3)OOH$ + $NpN\dot{C}_6H_5$	7.9×10^2 [200 K]		Toluene		5.38	9.5	f.p.	D.k. (esr) in soln. contg. 4% di-*tert*-butyl peroxide and 1% 1-methylcyclohexyl hydroperoxide; T range not given, generally starting at 200 K.	83A241
6.10	**Octylperoxyl**									
6.10.1	**α-Tocopherol**									
	$C_8H_{17}OO\cdot$ + ArOH → $C_8H_{17}OOH$ + $ArO\cdot$	1.4×10^7		2,3,4-Trimethylpentane	RT			p.r.	P.b.k. in oxygen-satd. soln. (mixture of radicals from solvent).	79G405
6.11	**Dodecylperoxyl**									
6.11.1	**α-Tocopherol**									
	$C_{12}H_{25}OO\cdot$ + ArOH → $C_{12}H_{25}OOH$ + $ArO\cdot$	1.5×10^7		*n*-Dodecane	RT			p.r.	P.b.k. in oxygen-satd. soln. (mixture of radicals from solvent).	79G405

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.1	**Allylperoxyl**						
7.1.1	**Ascorbate ion**						
	$CH_2{=}CHCH_2OO\cdot + AH^- \rightarrow CH_2{=}CHCH_2OOH + \cdot A^-$	1.4×10^6	9	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 40% 2-PrOH and 0.2% allyl bromide.	89A165
7.2	**Benzylperoxyl**						
7.2.1	**Ascorbate ion**						
	$C_6H_5CH_2OO\cdot + AH^- \rightarrow C_6H_5CH_2OOH + \cdot A^-$	2.5×10^6	7	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 0.2 mol L^{-1} benzylammonium ion.	89A165
		1.3×10^6	7	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 40% 2-PrOH and 0.05% benzyl chloride.	89A165
7.3	**4-Nitrobenzylperoxyl**						
7.3.1	**Ascorbate ion**						
	$4\text{-}NO_2C_6H_4CH_2OO\cdot + AH^- \rightarrow 4\text{-}NO_2C_6H_4CH_2OOH + \cdot A^-$	3.3×10^6	7	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 20% 2-PrOH and 10^{-3} mol L^{-1} 4-nitrobenzyl bromide	89A165
7.4	**Diphenylmethylperoxyl**						
7.4.1	**Ascorbate ion**						
	$(C_6H_5)_2CHOO\cdot + AH^- \rightarrow (C_6H_5)_2CHOOH + \cdot A^-$	9×10^6	7	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 0.02 mol L^{-1} diphenylmethylammonium ion.	89A165
7.5	**Hydroxymethylperoxyl**						
7.5.1	**Iron(III) deuteroporphyrin, dimethyl ester**						
	$HOCH_2OO\cdot + DPDMEFe^{III} \rightarrow [DPDMEFe^{III}]\cdot^+ + HOCH_2OO^-$	1.0×10^7	0-3	Water/ MeOH	p.r.	P.b.k. at 660 nm in air-satd. soln. contg. 50% MeOH and 1-4 $\times$ 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester.	85A311
7.5.2	**Pentabromoplatinate(III) ion**						
	$HOCH_2OO\cdot + PtBr_5^{2-} \rightarrow PtBr_5CH_3OH^- + HOCH_2OO^-$	2.5×10^8		MeOH	f.p.	D.k. (Pt^{III}) at 680 in air-satd. soln. contg. $PtBr_6^{2-}$ (+ $h\nu \rightarrow PtBr_5^{2-}$)	87A441
7.5.3	**Pentachloroplatinate(III) ion**						
	$HOCH_2OO\cdot + PtCl_5^{2-} \rightarrow PtCl_5CH_3OH^- + HOCH_2OO^-$	3.0×10^8		MeOH	f.p.	D.k. (Pt^{III}) at 530 in air-satd. soln. contg. $PtCl_6^{2-}$ (+ $h\nu \rightarrow PtCl_5^{2-}$)	87A441
7.5.4	**Ascorbate ion**						
	$HOCH_2OO\cdot + AH^- \rightarrow \cdot A^- + HOCH_2OOH$	4.7×10^6	7	Water	p.r.	P.b.k. in N_2O/O_2 (4:1) satd. soln. contg. 2 mol L^{-1} MeOH.	86A291
7.5.5	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$HOCH_2OO\cdot + TMPD \rightarrow HOCH_2OOH + TMPD\cdot^+ + OH^-$	7.2×10^7	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. MeOH.	89A165
7.6	**1-Hydroxyethylperoxyl**						
7.6.1	**Copper(I) ion**						
	$CH_3CH(OH)OO\cdot + Cu^+ \rightarrow CH_3CH(OH)OO^- + Cu^{2+}$	$>1 \times 10^9$		Ethanol	p.r.	P.b.k. in oxygen-satd. soln.; Cu^I from redn. of $CuCl_2$ in deoxygenated soln. by e^- irradiation.	670618
7.6.2	**Copper(II) ion**						
	$CH_3CH(OH)OO\cdot + Cu^{2+} \rightarrow$			Ethanol	p.r.	No reaction in oxygen-satd. soln. contg. 2×10^{-4} mol L^{-1} $CuCl_2$ or $Cu(OAc)_2$.	670618

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.6	**1-Hydroxyethylperoxyl**—Continued						
7.6.8	***N,N*-Dimethyl-4-nitrosoaniline**						
	$CH_3CH(OH)OO\cdot + Me_2NC_6H_4NO \rightarrow$	2.7×10^8		Water	p.r.	D.k. at 440 nm in oxygen-satd. soln. contg. EtOH.	680066
7.6.4	**α-Tocopherol**						
	$CH_3CH(OH)OO\cdot + ArOH \rightarrow ArO\cdot + CH_3CH(OH)OOH$	9.4×10^4		Ethanol	p.r.	P.b.k. at 400 nm in oxygen-satd. soln. contg. 2.8-47 $\times 10^{-3}$ mol L^{-1} tocopherol.	87A475
		9.1×10^4		Ethanol	γ-r.	Calcd. by data fitting of product formn. in aerated soln. contg. 7.9-540 $\times 10^{-6}$ mol L^{-1} tocopherol.	87A475
		9.5×10^4		Ethanol	p.r.	P.b.k. at 400 nm in oxygen-satd. soln. contg. 3×10^{-2} mol L^{-1} tocopherol.	86A464 86A554
7.7	**1-Hydroxy-1-methylethylperoxyl**						
7.7.1	**Copper(I) ion**						
	$(CH_3)_2C(OH)OO\cdot + Cu^+ \rightarrow [(CH_3)_2C(OH)OOCu]^+$	$\sim 2 \times 10^8$		2-PrOH	f.p.	P.b.k. at 415 nm in air-satd. soln. contg. $CuCl_2$.	86A175
7.7.2	**Iron(II) ion**						
	$(CH_3)_2C(OH)OO\cdot + Fe^{2+} \rightarrow [(CH_3)_2C(OH)OOFe]^{2+}$	1.7×10^6	<1	Water	p.r.	P.b.k. at 270 nm in air-satd. soln. contg. 1 mol L^{-1} 2-PrOH, 0.5 mol L^{-1} $HClO_4$, and 1.85 or 4.35 $\times 10^{-2}$ mol L^{-1} ferrous perchlorate; $E_a = 70$ kJ mol^{-1} for meas. from 291-307 K.	741074
7.7.3	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	$(CH_3)_2C(OH)OO\cdot +$ $DPDMEFe^{III}(HOCH(CH_3)_2)_2 \rightarrow$ $(CH_3)_2C(OH)OO^- +$ $[DPDMEFe^{III}(HOCH(CH_3)_2)_2]\cdot^+$	2.7×10^7	1	Water/ 2-PrOH	p.r.	P.b.k. at 655 nm in air-satd. soln. contg. 50% 2-PrOH, 0.1 mol L^{-1} $HClO_4$ and 0.5-1 $\times 10^{-4}$ mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester.	85A341
		6×10^7	<0	Water/	p.r.	P.b.k. at 655 nm in air-satd. soln.	85A311
		1×10^7	2	2-PrOH		contg. 50% 2-PrOH, 5% acetone, 0.01-1 mol L^{-1} $HClO_4$ and 0.5-1 $\times 10^{-4}$ mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester.	
7.7.4	**Ascorbate ion**						
	$(CH_3)_2C(OH)OO\cdot + AH^- \rightarrow$ $(CH_3)_2C(OH)OOH + \cdot A^-$	1.0×10^6	7	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 40%, 60% and 80% 2-PrOH.	89A165
		1.3×10^6	7	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 20% 2-PrOH.	89A165
		1.1×10^6	7	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 0.2% acetone.	89A165
7.7.5	**Linoleic acid**						
	$(CH_3)_2C(OH)OO\cdot + LH \rightarrow$	$\sim 6 \times 10^3$	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 0.1 mol L^{-1} $HClO_4$ and 0.5-1 $\times 10^{-4}$ mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; rel. to $k((CH_3)_2C(OH)OO\cdot + DPDMEFe^{III}) = 2.7 \times 10^7$.	85A341

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.7	**1-Hydroxy-1-methylethylperoxyl**—Continued						
7.7.6	**Oleic acid**						
	$(CH_3)_2C(OH)OO\cdot$ + $CH_3(CH_2)_7CH{=}CH(CH_2)_7CO_2H$ →	$<3 \times 10^3$	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 0.1 mol L^{-1} $HClO_4$ and 0.5-1 × 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; rel. to $k((CH_3)_2C(OH)OO\cdot$ + $DPDMEFe^{III}) = 2.7 \times 10^7$.	85A341
7.8	**2-Hydroxy-2,2-dimethylethylperoxyl**						
7.8.1	**Nitrilotriacetatocobaltate(II) ion**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + $CoNTA^-$ → $[Co(NTA)OOCH_2C(CH_3)_2OH]^-$	9.5×10^7	5.0	Water	p.r.	P.b.k. in soln. contg. N_2O-air (1:1) and 0.1 mol L^{-1} *tert*-BuOH.	78A436
		7.3×10^8	7.0				
		7.0×10^8	9.0				
7.8.2	**Ethylenediaminetetraacetatocobaltate(II) ion**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + $CoEDTA^{2-}$ → $[Co(EDTA)OOCH_2C(CH_3)_2OH]^{2-}$	2.5×10^6	5.0	Water	p.r.	P.b.k. in soln. contg. N_2O-air (1:1) and 0.1 mol L^{-1} *tert*-BuOH.	78A436
		2.0×10^6	7.0				
		1.8×10^6	9.0				
7.8.3	**Nitrilotriacetatomanganate(II) ion**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + $MnNTA^-$ → $[Mn(NTA)OOCH_2C(CH_3)_2OH]^-$	1.5×10^8	4.5	Water	p.r.	P.b.k. in soln. contg. N_2O-air (1:1) and 0.1 mol L^{-1} *tert*-BuOH.	78A436
		1.5×10^8	5.5				
		2.2×10^8	7.0				
		1.1×10^8	9.0				
7.8.4	**Ethylenediaminetetraacetatomanganate(II) ion**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + $MnEDTA^{2-}$ → $[Mn(EDTA)OOCH_2C(CH_3)_2OH]^{2-}$	6.5×10^6	5.5	Water	p.r.	P.b.k. in soln. contg. N_2O-air (1:1) and 0.1 mol L^{-1} *tert*-BuOH.	78A436
		6.0×10^6	7.0				
		1.7×10^7	9.0				
7.8.5	**Pentaammminenitrosylruthenium(III) ion, electron adduct**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + $Ru(NH_3)_5NO^{2+}$ →	3×10^9	7.5	Water	p.r.	D.k. in air-satd. soln. contg. $Ru(NH_3)_5NO^{3+}$ and 0.1 mol L^{-1} *tert*-BuOH.	751077
7.8.6	**Ascorbate ion**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + AH^- → $\cdot A^-$ + $(CH_3)_2C(OH)CH_2OOH$	1.8×10^6	9	Water/ *tert*-BuOH	p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 10% *tert*-BuOH.	89A165
		2.1×10^6	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 3 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} phosphate buffer.	80A053
7.8.7	**Superoxide dismutase**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + CuZnSOD →	$<1 \times 10^8$	9.0	Water	p.r.	D.k. at 680 nm in oxygenated soln. contg. 4.5 × 10^{-6} mol L^{-1} SOD and 0.5 mol L^{-1} *tert*-BuOH; peroxyl radical reacts slowly if at all.	80A391
7.8.8	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$(CH_3)_2C(OH)CH_2OO\cdot$ + TMPD → $(CH_3)_2C(OH)CH_2OOH$ + $TMPD^{\cdot+}$ + OH^-	3.4×10^7	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. *tert*-BuOH.	89A165
		5.5×10^7		Water	p.r.	P.b.k. in soln. contg. 3 × 10^{-4} mol L^{-1} oxygen, 5-10 × 10^{-5} mol L^{-1} TMPD, and *tert*-BuOH.	81A122
7.9	**1-Ethoxyethylperoxyl**						
7.9.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$CH_3CH_2OCH(CH_3)OO\cdot$ + TMPD → $CH_3CH_2OCH(CH_3)OOH$ + $TMPD^{\cdot+}$ + OH^-	4.4×10^7	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. diethyl ether.	89A165

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.10	**Tetrahydro-2-furanylperoxyl**						
7.10.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$-O(CH_2)_3CH(OO\cdot)-$ + TMPD → $-O(CH_2)_3CH(OOH)-$ + $TMPD^{\cdot+}$ + OH^-	3.7×10^7	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. tetrahydrofuran.	89A165
7.11	**2,5-Dioxacyclohexylperoxyl**						
7.11.1	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$-O(CH_2)_2OCH_2CH(OO\cdot)-$ + ABTS → $ABTS^{\cdot+}$	5.0×10^6	7	Water	p.r.	P.b.k. at 565 nm in air-satd. soln. contg. 1 mol L^{-1} dioxane; $k_{H2O}/k_{D2O} = 1.8$; studied at 273-313 K; $E_a = 14$ kJ mol^{-1}, log $A = 9.2$.	89A384
7.11.2	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$-O(CH_2)_2OCH_2CH(OO\cdot)-$ + TMPD → $TMPD^{\cdot+}$	1.6×10^8	8	Water	p.r.	P.b.k. at 565 nm in air-satd. soln. contg. 1 mol L^{-1} dioxane and 1-4 × 10^{-4} mol L^{-1} TMPD; $k_{H2O}/k_{D2O} = 1.7$; studied at 273-313 K; $E_a = 17$ kJ mol^{-1}, log $A = 11.3$.	89A384 89A165
7.12	**2,4,6-Trioxacyclohexylperoxyl**						
7.12.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$-OCH_2OCH_2OCH(OO\cdot)-$ + TMPD → $-OCH_2OCH_2OCH(OOH)-$ + $TMPD^{\cdot+}$ + OH^-	2.3×10^8	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. trioxane.	89A165
7.13	**1,3,5-Trimethyl-2,4,6-trioxacyclohexylperoxyl**						
7.13.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$-OCH(Me)OCH(Me)OC(Me)(OO\cdot)-$ + TMPD → $-OCH(CH_3)OCH(CH_3)OC(CH_3)(OOH)-$ + $TMPD^{\cdot+}$ + OH^-	1.1×10^8	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. trimethyltrioxane.	89A165
7.14	**Tri(methoxy)methoxymethylperoxyl**						
7.14.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$(CH_3O)_3COCH_2OO\cdot$ + TMPD → $(CH_3O)_3COCH_2OOH$ + $TMPD^{\cdot+}$ + OH^-	1.2×10^8	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. $(CH_3O)_3COCH_3$.	89A165
7.15	**Acetylperoxyl**						
7.15.1	**Ascorbate ion**						
	$CH_3C(O)OO\cdot + AH^-$ →	8.3×10^8		Water	p.r.		88A266
7.15.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CH_3C(O)OO\cdot$ + ABTS → $ABTS^{\cdot+}$ + $CH_3C(O)OO^-$	1.8×10^9		Water	p.r.	P.b.k. in N_2O/O_2 (4:1 v/v) satd. acetaldehyde soln. contg. ABTS.	88A266
7.15.3	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$CH_3C(O)OO\cdot$ + TMPD → $TMPD^{\cdot+}$ + $CH_3C(O)OO^-$	1.9×10^9	7.6-8.2	Water	p.r.	P.b.k. at 565 nm in N_2O/O_2 (4:1 v/v) satd. acetaldehyde soln. contg. 3.3-17 × 10^{-5} mol L^{-1} TMPD.	88A266
7.16	**2-Oxopropylperoxyl**						
7.16.1	**Ascorbate ion**						
	$CH_3COCH_2OO\cdot + AH^-$ → $CH_3COCH_2OOH + \cdot A^-$	7.5×10^0	9	Water	p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 7% acetone.	89A165
7.16.2	**Chlorpromazine, conjugate acid**						
	$CH_3COCH_2OO\cdot + CZH^+$ → $CH_3COCH_2OO^- + CZ^{\cdot+}$	~2×10^6		Water	p.r.	P.b.k at 525 nm in N_2O/O_2 (4:1) satd. soln. contg. acetone.	89A165

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.16	**2-Oxopropylperoxyl**—Continued						
7.16.3	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$CH_3COCH_2OO\cdot$ + TMPD → CH_3COCH_2OOH + $TMPD^{\cdot+}$ + OH^-	6.6×10^7	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. acetone.	89A165
		~6×10^7	11	Water	p.r.	P.b.k. at 565 nm in oxygen-satd. soln. contg. 0.1 mol L^{-1} acetone to which was added to Ar-satd. soln. contg. 4.5-10 $\times$ 10^{-5} mol L^{-1} TMPD.	86A285
7.17	**Pivaloylperoxyl**						
7.17.1	**2,6-Di-*tert*-butyl-4-methoxyphenol**						
	$(CH_3)_3CC(O)OO\cdot$ + ArOH →	1.1×10^5		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.2	**2,6-Di-*tert*-butyl-4-methylphenol**						
	$(CH_3)_3CC(O)OO\cdot$ + DTBMPhOH →	2.4×10^4		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.3	**3,4-Dihydro-6-hydroxy-5,7,8-trimethylbenzothiopyran**						
	$(CH_3)_3CC(O)OO\cdot$ + ArOH →	1.8×10^6		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.4	**1-Ethyl-1,2,3,4-tetrahydro-6-hydroxy-5,7,8-trimethylquinoline**						
	$(CH_3)_3CC(O)OO\cdot$ + ArOH →	2.0×10^6		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.5	**2,2,5,7,8-Pentamethylbenzopyran-6-ol**						
	$(CH_3)_3CC(O)OO\cdot$ + ArOH →	2.0×10^6		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.6	**4-Methoxy-2,3,5,6-tetramethylphenol**						
	$(CH_3)_3CC(O)OO\cdot$ + $CH_3O(CH_3)_4C_6OH$ →	2.8×10^5		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.7	**2,3,5,6-Tetramethylphenol**						
	$(CH_3)_3CC(O)OO\cdot$ + $(CH_3)_4C_6HOH$ →	6.9×10^4		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.8	**α-Tocopherol**						
	$(CH_3)_3CC(O)OO\cdot$ + ArOH →	2.6×10^6		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.9	**γ-Tocopherol**						
	$(CH_3)_3CC(O)OO\cdot$ + ArOH →	7.0×10^5		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.17.10	**δ-Tocopherol**						
	$(CH_3)_3CC(O)OO\cdot$ + ArOH →	3.3×10^5		CP or decane	f.p.	D.k. (esr) in oxygen-satd. soln. contg. 0.9 mol L^{-1} di-*tert*-butyl ketone.	85A380
7.18	**Carboxymethylperoxyl, anion**						
7.18.1	**Sulfite ion**						
	$\cdot OOCH_2CO_2^-$ + SO_3^{2-} →	$<4 \times 10^5$	8	Water	p.r.	D.k. at 305 nm in N_2O/O_2 (4:1) satd. soln. contg. acetate ion.	86A291

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.18	**Carboxymethylperoxyl, anion**—Continued						
7.18.2	**Ascorbate ion**						
	$\cdot OOCH_2CO_2^- + AH^- \rightarrow HOOCH_2CO_2^- + \cdot A^-$	2.2×10^6	7	Water	p.r.	P.b.k. in N_2O/O_2 (4:1) satd. soln. contg. acetate ion.	86A291
7.18.3	**Isobarbiturate ion**						
	$\cdot OOCH_2CO_2^- + IBO^- \rightarrow {}^-OOCH_2CO_2^- + IBO\cdot$	3.9×10^7	13	Water	p.r.	P.b.k. in N_2O/O_2 (4:1) satd. soln. contg. acetate ion	86A291
7.18.4	***N,N,N′,N′*-Tetramethyl-*p*-phenylenediamine**						
	$\cdot OOCH_2CO_2^- + TMPD \rightarrow HOOCH_2CO_2^- + TMPD\cdot^+ + OH^-$	6.0×10^7	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. acetate ion.	89A165
7.19	**Peroxyl radicals from octanoic acid**						
7.19.1	**α-Tocopherol**						
	$R(CO_2H)OO\cdot + ArOH \rightarrow R(CO_2H)OOH + ArO\cdot$	2.8×10^6		Octanoic acid	p.r.	P.b.k. in oxygen-satd. soln. (mixture of radicals from solvent).	79G405
7.20	**Cyanomethylperoxyl**						
7.20.1	**Ascorbate ion**						
	$NCCH_2OO\cdot + AH^- \rightarrow NCCH_2OOH + \cdot A^-$	5.0×10^7	9	Water/ Acetonitrile	p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 10% acetonitrile.	89A165
7.20.2	**Chlorpromazine, conjugate acid**						
	$NCCH_2OO\cdot + CZH^+ \rightarrow NCCH_2OO^- + CZ\cdot^+$	6.8×10^6		Water/ Acetonitrile	p.r.	P.b.k at 525 nm in N_2O/O_2 (4:1) satd. soln. contg. 10% acetonitrile.	89A165
7.20.3	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid**						
	$NCCH_2OO\cdot + HTxOH \rightarrow$	$\sim 2 \times 10^6$		Acetonitrile	p.r.	P.b.k. at 360 nm in air-satd. soln.	89A384
7.20.4	***N,N,N′,N′*-Tetramethyl-*p*-phenylenediamine**						
	$NCCH_2OO\cdot + TMPD \rightarrow NCCH_2OOH + TMPD\cdot^+ + OH^-$	2.9×10^8	~8	Water	p.r.	P.b.k at 565 nm in N_2O/O_2 (4:1) satd. soln. contg. acetonitrile.	89A165
7.21	**Trimethylammoniomethylperoxyl**						
7.21.1	**Ascorbate ion**						
	$(CH_3)_3N^+CH_2OO\cdot + AH^- \rightarrow (CH_3)_3N^+CH_2OOH + \cdot A^-$	4.0×10^8	7	Water	p.r.	P.b.k at 360 nm in N_2O/O_2 (4:1) satd. soln. contg. 0.6 mol L^{-1} $(CH_3)_4N^+$.	89A165
7.22	**Fluoromethylperoxyl**						
7.22.1	**Ascorbate ion**						
	$CH_2FOO\cdot + AH^- \rightarrow CH_2FOOH + \cdot A^-$	1.7×10^8	8	Water	p.r.	P.b.k at 360 nm in soln. contg. 5% 2-PrOH and CH_2FCl/O_2 (4:1).	89A165
		7.7×10^7	8	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in soln. contg. 40% 2-PrOH and CH_2FCl/O_2 (4:1).	89A165
7.23	**Carboxy(difluoro)methylperoxyl, anion**						
7.23.1	**Phenoxide ion**						
	$\cdot OOCF_2CO_2^- + C_6H_5O^- \rightarrow {}^-OOCF_2CO_2^- + C_6H_5O\cdot$	1.5×10^7	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CF_2ClCO_2^-$.	80A053
7.23.2	**Promethazine, conjugate acid**						
	$\cdot OOCF_2CO_2^- + PZH^+ \rightarrow {}^-OOCF_2CO_2^- + PZ\cdot^+$	5.6×10^7	6	Water/ *tert*-BuOH	p.r.	P.b.k. at 510 nm in air-satd. soln. contg. 30% *tert*-BuOH, 0.01 mol L^{-1} phosphate buffer and $CClF_2CO_2^-$.	80A053

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.23	**Carboxy(difluoro)methylperoxyl, anion**—Continued						
7.23.3	**Tyrosine, negative ion**						
	$\cdot OOCF_2CO_2^- + TyrO^- \rightarrow {}^-OOCF_2CO_2^- + TyrO\cdot$	3.0×10^7	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CClF_2CO_2^-$.	80A053
7.24	**Trifluoromethylperoxyl**						
7.24.1	**Iron(III) deuteroporphyrin IX**						
	$CF_3OO\cdot + DPFe^{III} \rightarrow [DPFe^{III}]\cdot^+ + CF_3OO^-$	3.9×10^8	12.7	Water/ 2-PrOH	p.r.	P.b.k. at 700 nm in soln. contg. 50% 2-PrOH, 0.05 mol L^{-1} NaOH and satd. with a mixture of CF_3Br and O_2 (4:1).	87A232
7.24.2	**Ascorbate ion**						
	$CF_3OO\cdot + AH^- \rightarrow CF_3OOH + \cdot A^-$	1.9×10^8	7	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 50% 2-PrOH.	89A384
		6.8×10^8	7	Water/ MeOH	p.r.	P.b.k. at 360 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 10% MeOH	89A384 87A480
7.24.3	**Chlorpromazine, conjugate acid**						
	$CF_3OO\cdot + CZH^+ \rightarrow CF_3OO^- + CZ\cdot^+$	1.2×10^9	5.4	Water/ MeOH	p.r.	P.b.k. in air-satd. soln. contg. 10% MeOH and CF_3Br/air.	87A480
7.24.4	**Hydroquinone**						
	$CF_3OO\cdot + 1,4\text{-}C_6H_4(OH)_2 \rightarrow CF_3OO^- + 4\text{-}{}^-OC_6H_4O\cdot + H^+$	7.9×10^7	7	Water/ MeOH	p.r.	P.b.k. in air-satd. soln. contg. 10% MeOH and CF_3Cl/air or CF_3Br/air.	87A480
7.24.5	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion**						
	$CF_3OO\cdot + TxOH^- \rightarrow CF_3OO^- + HTxO\cdot$	5.4×10^8 7.0×10^8 7.4×10^8	~4	Water/ MeOH	p.r.	P.b.k. at 420 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 10%, 25% and 50% MeOH, respectively.	89A384
		4.7×10^8	~4	Water/ 2-PrOH	p.r.	P.b.k. at 420 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 10% 2-PrOH.	89A384
		4.2×10^8	~4	MeOH/ ·Water	p.r.	P.b.k. at 420 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 75% MeOH.	89A384
		1.5×10^8		MeOH	p.r.	P.b.k. at 420 nm in CF_3Br/O_2 (4:1) satd. soln.	89A384
7.24.6	**Linolenic acid**						
	$CF_3OO\cdot + CH_3(CH_2CH{=}CH)_3(CH_2)_7CO_2H \rightarrow$	6.9×10^6	12.7	Water/ 2-PrOH	p.r.	C.k.; obs. 700 nm buildup for $[DPFe^{III}]\cdot^+$ in water contg. 50% 2-PrOH, 0.05 mol L^{-1} NaOH, 7×10^{-5} mol L^{-1} iron(III) deuteroporphyrin, and 0-0.02 mol L^{-1} linolenic acid, satd. with CF_3Br/O_2 (4:1); rel. to $k(CF_3OO\cdot + DPFe^{III}) = 3.9 \times 10^8$.	87A232
7.24.7	**4-Methoxyphenol**						
	$CF_3OO\cdot + 4\text{-}CH_3OC_6H_4OH \rightarrow CF_3OO^- + H^+ + 4\text{-}CH_3OC_6H_4O\cdot$	5.2×10^7	7	Water/ MeOH	p.r.	P.b.k. in soln. contg. 10% MeOH and CF_3Br/air.	87A480
7.24.8	**Phenol**						
	$CF_3OO\cdot + C_6H_5OH \rightarrow CF_3OO^- + H^+ + C_6H_5O\cdot$	2×10^6	7	Water/ MeOH	p.r.	P.b.k. in soln. contg. 10% MeOH and CF_3Br/air.	87A480
7.24.9	**Urate ion**						
	$CF_3OO\cdot + UrO^- \rightarrow CF_3OO^- + UrO\cdot$	1.0×10^9	13	Water/ MeOH	p.r.	P.b.k. in soln. contg. 10% MeOH and CF_3Br/air.	87A480

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.24	**Trifluoromethylperoxyl**—Continued						
7.24.9	**Urate ion**—Continued						
		1.3×10^9	13	Water/ MeOH	p.r.	P.b.k. at 360 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 50% MeOH and 0.1 mol L^{-1} KOH.	89A384
		1.0×10^9 2.9×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 10% and 50% 2-PrOH, respectively, and 0.1 mol L^{-1} KOH.	89A384
		1.4×10^8	13	2-PrOH/ Water	p.r.	P.b.k. at 360 nm in CF_3Br/O_2 (4:1) satd. soln. contg. 70% 2-PrOH and 0.1 mol L^{-1} KOH.	89A384
7.24.10	**Xanthine, negative ion**						
	$CF_3OO\cdot + XO^- \rightarrow CF_3OO^- + XO\cdot$	1.0×10^9	13	Water/ MeOH	p.r.	P.b.k. in soln. contg. 10% MeOH and CF_3Br/air.	87A480
7.25	**1,2,2-Trifluoro-2-(difluoromethoxy)ethylperoxyl**						
7.25.1	**Ascorbate ion**						
	$CHF_2OCF_2CHFOO\cdot + AH^- \rightarrow CHF_2OCF_2CHFOOH + \cdot A^-$	4.8×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and enflurane.	88A364
7.25.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CHF_2OCF_2CHFOO\cdot + ABTS \rightarrow CHF_2OCF_2CHFOO^- + ABTS\cdot^+$	5.0×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and enflurane.	88A364
7.25.3	**Chlorpromazine, conjugate acid**						
	$CHF_2OCF_2CHFOO\cdot + CZH^+ \rightarrow CHF_2OCF_2CHFOOH + CZ\cdot^+$	7.5×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and enflurane.	88A364
7.25.4	**Promethazine, conjugate acid**						
	$CHF_2OCF_2CHFOO\cdot + PZH^+ \rightarrow CHF_2OCF_2CHFOOH + PZ\cdot^+$	3.4×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and enflurane.	88A364
7.25.5	**Propyl 3,4,5-trihydroxybenzoate**						
	$CHF_2OCF_2CHFOO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CHF_2OCF_2CHFOOH + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	5.4×10^7 1.1×10^9	5-6 8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and enflurane.	88A364
7.26	**2,2,2-Trifluoro-1-difluoromethoxyethylperoxyl**						
7.26.1	**Ascorbate ion**						
	$CHF_2OCH(CF_3)OO\cdot + AH^- \rightarrow CHF_2OCH(CF_3)OOH + \cdot A^-$	2.7×10^9	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and isoflurane.	88A364
7.26.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CHF_2OCH(CF_3)OO\cdot + ABTS \rightarrow CHF_2OCH(CF_3)OO^- + ABTS\cdot^+$	1.0×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and isoflurane.	88A364
7.26.3	**Chlorpromazine, conjugate acid**						
	$CHF_2OCH(CF_3)OO\cdot + CZH^+ \rightarrow CHF_2OCH(CF_3)OO^- + CZ\cdot^+$	3.1×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and isoflurane.	88A364
7.26.4	**Promethazine, conjugate acid**						
	$CHF_2OCH(CF_3)OO\cdot + PZH^+ \rightarrow CHF_2OCH(CF_3)OO^- + PZ\cdot^+$	1.2×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and isoflurane.	88A364
7.26.5	**Propyl 3,4,5-trihydroxybenzoate**						
	$CHF_2OCH(CF_3)OO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CHF_2OCH(CF_3)OOH + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	2.1×10^7 4.5×10^8	5-6 8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and isoflurane.	88A364

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.27	**Chloromethylperoxyl**						
7.27.1	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	$CH_2ClOO\cdot$ + DPDMEFe^{III}(HOCH(CH$_3$)$_2$)$_2$ → CH_2ClOO^- + [DPDMEFe^{III}(HOCH(CH$_3$)$_2$)$_2$]$\cdot^+$	7.7×10^7	<3	Water/ 2-PrOH	p.r.	P.b.k. at 660 nm in air-satd. soln. contg. 50% 2-PrOH, 2×10^{-3} mol L^{-1} $HClO_4$, and 0.2-0.3 mol L^{-1} methylene chloride.	84A178
7.27.2	**5,10,15,20-Tetrakis(4-methylphenyl)porphinatozinc(II)**						
	$CH_2ClOO\cdot$ + ZnTTP → CH_2ClOO^- + [ZnTTP]$\cdot^+$	$\sim 1 \times 10^9$		CH_2Cl_2	p.r.	P.b.k at 640 nm in air-satd. soln. contg. $>5 \times 10^{-5}$ mol L^{-1} ZnTPP.	89A059
7.27.3	**5,10,15,20-Tetrakis(4-methylphenyl)porphinatozinc(II) pyridine complex**						
	$CH_2ClOO\cdot$ + ZnTTP(py) → CH_2ClOO^- + [ZnTTP(py)]$\cdot^+$	2.6×10^7		CH_2Cl_2	p.r.	P.b.k at 640 nm in air-satd. soln. contg. 5-15 $\times 10^{-5}$ mol L^{-1} ZnTPP and 1% pyridine.	89A059
7.27.4	**Aniline**						
	$CH_2ClOO\cdot$ + $C_6H_5NH_2$ → CH_2ClOOH + $C_6H_5\dot{N}H$	$\sim 5 \times 10^4$		CH_2Cl_2	p.r.	P.b.k at 370 nm in air-satd. soln. contg. 1 mol L^{-1} aniline.	89A059
7.27.5	**Ascorbate ion**						
	$CH_2ClOO\cdot$ + AH^- → CH_2ClOOH + $\cdot A^-$	1.2×10^8	8	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 5% 2-PrOH and 0.02% CH_2Cl_2.	89A165
		9.2×10^7	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.01 mol L^{-1} phosphate buffer and CH_2Cl_2.	80A053
7.27.6	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CH_2ClOO\cdot$ + ABTS → CH_2ClOO^- + ABTS$\cdot^+$	4.4×10^7	6.6	Water/ *tert*-BuOH	p.r.	P.b.k. at 415 nm in air-satd. soln. contg. 20% *tert*-BuOH and 0.02 mol L^{-1} CH_2Cl_2.	82A196
7.27.7	**Bilirubin dianion**						
	$CH_2ClOO\cdot$ + BR^{2-} → CH_2ClOO^- + $BR\cdot^-$	1.5×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CH_2Cl_2 and bilirubin.	89A901
7.27.8	**Chlorpromazine, conjugate acid**						
	$CH_2ClOO\cdot$ + CZH^+ → $CZ\cdot^+$ + CH_2ClOO^-	1.5×10^5		2-PrOH/ Water	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 60% 2-PrOH, and 10% CH_2Cl_2.	87A173
		2.5×10^7		Water/ 2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 11% 2-PrOH, and 0.1% CH_2Cl_2.	87A173
7.27.9	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion**						
	$CH_2ClOO\cdot$ + $TxOH^-$ → CH_2ClOO^- + $HTxO\cdot$	1.6×10^7	7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH, 10^{-2} mol L^{-1} CH_2Cl_2 and 0.01 mol L^{-1} Trolox C.	88A436
7.27.10	**4-Methoxyphenol**						
	$CH_2ClOO\cdot$ + 4-$CH_3OC_6H_4OH$ → CH_2ClOOH + 4-$CH_3OC_6H_4O\cdot$	2×10^5		CH_2Cl_2	p.r.	P.b.k at 420 nm in air-satd. soln. contg. 0.10 mol L^{-1} 4-methoxyphenol.	89A059
7.27.11	**Phenoxide ion**						
	$CH_2ClOO\cdot$ + $C_6H_5O^-$ → CH_2ClOO^- + $C_6H_5O\cdot$	1.1×10^7	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and CH_2Cl_2.	80A053

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.27	**Chloromethylperoxyl**—Continued						
7.27.12	**Promethazine, conjugate acid**						
	$CH_2ClOO\cdot + PZH^+ \rightarrow CH_2ClOO^- + PZ\cdot^+$	3.3×10^7 3.6×10^7	6 7	Water/ *tert*-BuOH	p.r.	P.b.k. at 510 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.01 mol L^{-1} phosphate buffer and CH_2Cl_2.	80A053
7.27.13	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$CH_2ClOO\cdot + TMPD \rightarrow CH_2ClOOH + TMPD\cdot^+ + OH^-$	4.2×10^8	~8	Water	p.r.	P.b.k at 565 nm in air-satd. soln. contg. CH_2Cl_2.	89A165
7.27.14	**Tyrosine, negative ion**						
	$CH_2ClOO\cdot + TyrO^- \rightarrow CH_2ClOO^- + TyrO\cdot$	2.1×10^7	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and CH_2Cl_2.	80A053
7.28	**1-Chloroethylperoxyl**						
7.28.1	**Ascorbate ion**						
	$CH_3CHClOO\cdot + AH^- \rightarrow CH_3CHClOOH + \cdot A^-$	9.2×10^7	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1-dichloroethane.	88A364
7.28.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CH_3CHClOO\cdot + ABTS \rightarrow CH_3CHClOO^- + ABTS\cdot^+$	3.3×10^7	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1-dichloroethane.	88A364
7.28.3	**Chlorpromazine, conjugate acid**						
	$CH_3CHClOO\cdot + CZH^+ \rightarrow CH_3CHClOOH + CZ\cdot^+$	8.9×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1-dichloroethane.	88A364
7.28.4	**Promethazine, conjugate acid**						
	$CH_3CHClOO\cdot + PZH^+ \rightarrow CH_3CHClOOH + PZ\cdot^+$	8.9×10^7	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1-dichloroethane.	88A364
7.28.5	**Propyl 3,4,5-trihydroxybenzoate**						
	$CH_3CHClOO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CH_3CHClOOH + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	2.9×10^7 7.3×10^8	5-6 8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1-dichloroethane.	88A364
7.29	**2-Chloroethylperoxyl**						
7.29.1	**Ascorbate ion**						
	$ClCH_2CH_2OO\cdot + AH^- \rightarrow ClCH_2CH_2OOH + \cdot A^-$	5.0×10^6	7	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 0.1% 1,2-dichloroethane.	89A165
7.29.2	**Bilirubin dianion**						
	$ClCH_2CH_2OO\cdot + BR^{2-} \rightarrow ClCH_2CH_2OO^- + BR\cdot^-$	8.4×10^7	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CH_2ClCH_2Cl and bilirubin.	89A901
7.30	**Carboxy(chloro)methylperoxyl, anion**						
7.30.1	**Ascorbate ion**						
	$\cdot OOCHClCO_2^- + AH^- \rightarrow HOOCHClCO_2^- + \cdot A^-$	5.1×10^7	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 30% *tert*-BuOH, 0.01 mol L^{-1} phosphate buffer and $CHCl_2CO_2^-$.	80A053
7.30.2	**Phenoxide ion**						
	$\cdot OOCHClCO_2^- + C_6H_5O^- \rightarrow {}^-OOCHClCO_2^- + C_6H_5O\cdot$	7.1×10^6	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CHCl_2CO_2^-$.	80A053

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.30	**Carboxy(chloro)methylperoxyl, anion**—Continued						
7.30.3	**Promethazine, conjugate acid**						
	$\cdot OOCHClCO_2^- + PZH^+ \rightarrow$ $^-OOCHClCO_2^- + PZ\cdot^+$	3.0×10^7 2.7×10^7	6 7	Water/ *tert*-BuOH	p.r.	P.b.k. at 510 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.01 mol L^{-1} phosphate buffer and $CHCl_2CO_2^-$.	80A053
7.30.4	**Tyrosine, negative ion**						
	$\cdot OOCHClCO_2^- + TyrO^- \rightarrow$ $^-OOCHClCO_2^- + TyrO\cdot$	1.2×10^7	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CHCl_2CO_2^-$.	80A053
7.31	**Chlorodifluoromethylperoxyl**						
7.31.1	**Bilirubin dianion**						
	$CF_2ClOO\cdot + BR^{2-} \rightarrow CF_2ClOO^- +$ $BR\cdot^-$	9.9×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CF_2CCl_2 and bilirubin.	89A901
7.32	**1-Chloro-2,2,2-trifluoroethylperoxyl**						
7.32.1	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	$CF_3CHClOO\cdot +$ $DPDMEFe^{III}(HOCH(CH_3)_2)_2 \rightarrow$ $CF_3CHClOO^- +$ $[DPDMEFe^{III}(HOCH(CH_3)_2)_2]\cdot^+$	9×10^7	1	Water/ 2-PrOH	p.r.	P.b.k. at 655 nm in air-satd. soln. contg. 50% 2-PrOH, 3% halothane, and 0.1 mol L^{-1} $HClO_4$.	85A341
		6.0×10^7	<3	Water/ 2-PrOH	p.r.	P.b.k. at 655 nm in air-satd. soln. contg. 50% 2-PrOH, 3% halothane, and 2×10^{-3} mol L^{-1} $HClO_4$.	84A178
7.32.2	**Iron(III) deuteroporphyrin IX (2-propoxy)(2-propanol)**						
	$CF_3CHClOO\cdot +$ $DPFe^{III}OCH(CH_3)_2(HOCH(CH_3)_2) \rightarrow$ $CF_3CHClOO^- +$ $[DPFe^{III}OCH(CH_3)_2(HOCH(CH_3)_2)]\cdot^+$	3.5×10^7	11.7	Water/ 2-PrOH	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 50% 2-PrOH, 3% halothane, and 0.05 mol L^{-1} NaOH.	84A178
7.32.3	**Arachidonic acid**						
	$CF_3CHClOO\cdot +$ $CH_3(CH_2)_3(CH_2CH{=}CH)_4(CH_2)_3CO_2H$ $\rightarrow$	1.5×10^6		Water/ *tert*-BuOH	p.r.	C.k. in 50% *tert*-BuOH soln. contg. 0.1 mol L^{-1} halothane; rel. to $k(CF_3CHClOO\cdot + ABTS) = 3.9 \times 10^8$.	83A364
7.32.4	**Ascorbate ion**						
	$CF_3CHClOO\cdot + AH^- \rightarrow$ $CF_3CHClOOH + \cdot A^-$	6.1×10^8 2×10^8	7 4	Water/ *tert*-BuOH	p.r.	P.b.k. at 360 nm in soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195
7.32.5	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CF_3CHClOO\cdot + ABTS \rightarrow$ $CF_3CHClOO^- + ABTS\cdot^+$	5×10^8		Water	p.r.	P.b.k. at 415 nm in air-satd. soln. contg. 2% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195
		3.9×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. at 415 nm in air-satd. soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane; overall rate.	83A195
		2.5×10^8		Water/ *tert*-BuOH	p.r.	P.b.k. at 415 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195
7.32.6	**Chlorpromazine, conjugate acid**						
	$CF_3CHClOO\cdot + CZH^+ \rightarrow CZ\cdot^+ +$ $CF_3CHClOO^-$	3.5×10^6		2-PrOH/ Water/ $CF_3CHClBr$	p.r.	P.b.k. at 525 nm in soln. contg. 60% 2-PrOH, and 10% halothane.	87A173
		5×10^8	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 525 nm in soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.32	**1-Chloro-2,2,2-trifluoroethylperoxyl**—Continued						
7.32.7	**Cholesterol**						
	$CF_3CHClOO\cdot + C_{27}H_{46}O \rightarrow$	$\sim 5 \times 10^4$	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% halothane, 0.5-1 × 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester, and 0.1 mol L^{-1} $HClO_4$; rel. to $k(CF_3CHClOO\cdot + DPDMEFe^{III}) = 9 \times 10^7$.	85A341
7.32.8	**Cysteine**						
	$CF_3CHClOO\cdot + CysSH \rightarrow CF_3CHClOOH + CysS\cdot$	2.9×10^7	7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A385
7.32.9	**Dimethyl sulfide**						
	$CF_3CHClOO\cdot + CH_3SCH_3 \rightarrow CF_3CHClOO^- + (CH_3)_2S^{\cdot+}$	6.0×10^6		Water/ *tert*-BuOH	p.r.	P.b.k. at 465 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.03 mol L^{-1} halothane.	85A123
7.32.10	**Linoleic acid**						
	$CF_3CHClOO\cdot + LH \rightarrow$	8×10^5		Water/ *tert*-BuOH	p.r.	C.k. in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} halothane; rel. to $k(CF_3CHClOO\cdot + ABTS) = 3.9 \times 10^8$.	83A364
		8×10^4	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% halothane, 0.5-1 × 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester, and 0.1 mol L^{-1} $HClO_4$; rel. to $k(CF_3CHClOO\cdot + DPDMEFe^{III}) = 9 \times 10^7$.	85A341
7.32.11	**Linolenic acid**						
	$CF_3CHClOO\cdot + CH_3(CH_2CH{=}CH)_3(CH_2)_7CO_2H \rightarrow$	1.3×10^6		Water/ *tert*-BuOH	p.r.	C.k. in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} halothane; rel. to $k(CF_3CHClOO\cdot + ABTS) = 3.9 \times 10^8$.	83A364
		3×10^5	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% halothane, 0.5-1 × 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester, and 0.1 mol L^{-1} $HClO_4$; rel. to $k(CF_3CHClOO\cdot + DPDMEFe^{III}) = 9 \times 10^7$.	85A341
7.32.12	**Methionine**						
	$CF_3CHClOO\cdot + Met \rightarrow$	1.4×10^6	10	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 30% 2-PrOH and 0.03 mol L^{-1} halothane; rel. to $k(CF_3CHClOO\cdot + ABTS) = 3.9 \times 10^8$.	85A123
7.32.13	**Metlazinic acid, conjugate base**						
	$CF_3CHClOO\cdot + MZ^- \rightarrow CF_3CHClOO^- + MZ\cdot$	1.1×10^9	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 530 nm in air-satd. soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195
7.32.14	**Oleic acid**						
	$CF_3CHClOO\cdot + CH_3(CH_2)_7CH{=}CH(CH_2)_7CO_2H \rightarrow$	3×10^5		Water/ *tert*-BuOH	p.r.	C.k. in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} halothane; rel. to $k(CF_3CHClOO\cdot + ABTS) = 3.9 \times 10^8$.	83A364

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.32	**1-Chloro-2,2,2-trifluoroethylperoxyl**—Continued						
7.32.14	**Oleic acid**—Continued						
		2×10^4	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% halothane, 0.5-1 × 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester, and 0.1 mol L^{-1} $HClO_4$; rel. to $k(CF_3CHClOO\cdot + DPDMEFe^{III}) = 9 \times 10^7$.	85A341
7.32.15	**Promethazine, conjugate acid**						
	$CF_3CHClOO\cdot + PZH^+ \rightarrow CF_3CHClOO^- + PZ\cdot^+$	2.4×10^8	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 505 nm in air-satd. soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195
7.32.16	**Propyl 3,4,5-trihydroxybenzoate**						
	$CF_3CHClOO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CF_3CHClOOH + H^+ + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	9.4×10^7 9×10^8	7 3.5	Water/ *tert*-BuOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195
7.32.17	**α-Tocopherol**						
	$CF_3CHClOO\cdot + ArOH \rightarrow ArO\cdot + CF_3CHClOOH$	9.2×10^7	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 425 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A195
7.32.18	**Tyrosine, negative ion**						
	$CF_3CHClOO\cdot + TyrO^- \rightarrow CF_3CHClOO^- + TyrO\cdot$	1.2×10^8	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 10% *tert*-BuOH and 0.01 mol L^{-1} halothane.	83A385
7.33	**2-Chloro-1,1,2,2-tetrafluoroethylperoxyl**						
7.33.1	**Bilirubin dianion**						
	$CF_2ClCF_2OO\cdot + BR^{2-} \rightarrow CF_2ClCF_2OO^- + BR\cdot^-$	6.9×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CF_2CCF_2Cl and bilirubin.	89A901
7.34	**1-Chloro-2,2-difluoro-2-methoxyethylperoxyl**						
7.34.1	**Ascorbate ion**						
	$CH_3OCF_2CHClOO\cdot + AH^- \rightarrow CH_3OCF_2CHClOOH + \cdot A^-$	3.3×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and methoxyflurane.	88A364
7.34.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CH_3OCF_2CHClOO\cdot + ABTS \rightarrow CH_3OCF_2CHClOO^- + ABTS\cdot^+$	3.4×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and methoxyflurane.	88A364
7.34.3	**Chlorpromazine, conjugate acid**						
	$CH_3OCF_2CHClOO\cdot + CZH^+ \rightarrow CH_3OCF_2CHClOO^- + CZ\cdot^+$	4.7×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and methoxyflurane.	88A364
7.34.4	**Promethazine, conjugate acid**						
	$CH_3OCF_2CHClOO\cdot + PZH^+ \rightarrow CH_3OCF_2CHClOO^- + PZ\cdot^+$	2.8×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and methoxyflurane.	88A364
7.34.5	**Propyl 3,4,5-trihydroxybenzoate**						
	$CH_3OCF_2CHClOO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CH_3OCF_2CHClOO^- + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	2.7×10^7 5.5×10^8	5-6 8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and methoxyflurane.	88A364

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.35	**Dichloromethylperoxyl**						
7.35.1	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	$CHCl_2OO\cdot$ + DPDMEFe^{III}(HOCH(CH$_3$)$_2$)$_2$ → $CHCl_2OO^-$ + [DPDMEFe^{III}(HOCH(CH$_3$)$_2$)$_2$]$\cdot^+$	8.2×10^7	<3	Water/ 2-PrOH	p.r.	P.b.k. at 660 nm in air-satd. soln. contg. 50% 2-PrOH, 0.2-0.3 mol L^{-1} chloroform, and 2×10^{-3} mol L^{-1} $HClO_4$.	84A178
7.35.2	**5,10,15,20-Tetrakis(4-methylphenyl)porphinatozinc(II)**						
	$CHCl_2OO\cdot$ + ZnTTP → $CHCl_2OO^-$ + [ZnTTP]$\cdot^+$	3×10^9		CH_2Cl_2	p.r.	P.b.k at 640 nm in air-satd. soln. contg. 1-5 × 10^{-5} mol L^{-1} ZnTPP.	89A059
7.35.3	**5,10,15,20-Tetrakis(4-methylphenyl)porphinatozinc(II) pyridine complex**						
	$CHCl_2OO\cdot$ + ZnTTP(py) → $CHCl_2OO^-$ + [ZnTTP(py)]$\cdot^+$	2.7×10^8		CH_2Cl_2	p.r.	P.b.k at 640 nm in air-satd. soln. contg. 2-10 × 10^{-5} mol L^{-1} ZnTPP and 1% pyridine.	89A059
7.35.4	**Aniline**						
	$CHCl_2OO\cdot$ + $C_6H_5NH_2$ → $CHCl_2OOH$ + $C_6H_5\dot{N}H$	1×10^6		CH_2Cl_2	p.r.	P.b.k in air-satd. soln. contg. 4-17 × 10^{-3} mol L^{-1} aniline.	89A059
7.35.5	**Ascorbate ion**						
	$CHCl_2OO\cdot$ + AH^- → $CHCl_2OOH$ + $\cdot A^-$	7.0×10^8	7	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 5% 2-PrOH and 0.1% $CHCl_3$.	89A165
		2.6×10^8 1.8×10^8	7 7	Water/ *tert*-BuOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 3 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} phosphate buffer and $CHCl_3$; k measured at two different laboratories.	80A053
7.35.6	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CHCl_2OO\cdot$ + ABTS → $CHCl_2OO^-$ + ABTS$\cdot^+$	6.5×10^8	6.4	Water/ *tert*-BuOH	p.r.	P.b.k. at 415 nm in air-satd. soln. contg. 20% *tert*-BuOH and 0.02 mol L^{-1} $CHCl_3$.	82A196
7.35.7	**Bilirubin dianion**						
	$CHCl_2OO\cdot$ + BR^{2-} → $CHCl_2OO^-$ + $BR\cdot^-$	3.4×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, $CHCl_3$ and bilirubin.	89A901
7.35.8	**Chlorpromazine, conjugate acid**						
	$CHCl_2OO\cdot$ + CZH^+ → $CZ\cdot^+$ + $CHCl_2OO^-$	3.6×10^8		Water/ 2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 11% 2-PrOH, and 0.1% $CHCl_3$.	87A173
		1.1×10^8		Water/ 2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 33% 2-PrOH, and 0.5% $CHCl_3$.	87A173
		8.3×10^6		2-PrOH/ Water	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 60% 2-PrOH, and 10% $CHCl_3$.	87A173
7.35.9	***N,N*-Dimethylaniline**						
	$CHCl_2OO\cdot$ + $C_6H_5N(CH_3)_2$ → $CHCl_2OO^-$ + [$C_6H_5N(CH_3)_2$]$\cdot^+$	2.5×10^7		CH_2Cl_2	p.r.	P.b.k in air-satd. soln. contg. 0.2-220 × 10^{-3} mol L^{-1} dimethylaniline.	89A059
7.35.10	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion**						
	$CHCl_2OO\cdot$ + $TxOH^-$ → $CHCl_2OO^-$ + HTxO$\cdot$	1.1×10^8	7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH, 10^{-2} mol L^{-1} $CHCl_3$ and 0.01 mol L^{-1} Trolox C.	88A436
7.35.11	**4-Methoxyphenol**						
	$CHCl_2OO\cdot$ + 4-$CH_3OC_6H_4OH$ → $CHCl_2OOH$ + 4-$CH_3OC_6H_4O\cdot$	6×10^5		CH_2Cl_2	p.r.	P.b.k at 420 nm in air-satd. soln. contg. 0.02-0.10 mol L^{-1} 4-methoxyphenol,	89A059

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.35	**Dichloromethylperoxyl**—Continued						
7.35.12	**Phenoxide ion**						
	$CHCl_2OO\cdot + C_6H_5O^- \rightarrow CHCl_2OO^- + C_6H_5O\cdot$	1.1×10^8	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CHCl_3$.	80A053
7.35.13	**Promethazine, conjugate acid**						
	$CHCl_2OO\cdot + PZH^+ \rightarrow CHCl_2OO^- + PZ\cdot^+$	1.4×10^8 6.7×10^7	6 7	Water/ *tert*-BuOH	p.r.	P.b.k. at 510 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.01 mol L^{-1} phosphate buffer and $CHCl_3$.	80A053
7.35.14	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$CHCl_2OO\cdot$ + TMPD $\rightarrow CHCl_2OO^-$ + TMPD$\cdot^+$	3×10^8		CH_2Cl_2	p.r.	P.b.k at 570 nm in air-satd. soln. contg. 4-32 $\times 10^{-4}$ mol L^{-1} TMPD.	89A059
		7.4×10^8	~8	Water	p.r.	P.b.k at 565 nm in Ar/O_2 (4:1) satd. soln. contg. chloroform.	89A165
7.35.15	**Tyrosine, negative ion**						
	$CHCl_2OO\cdot + TyrO^- \rightarrow CHCl_2OO^- + TyrO\cdot$	1.0×10^8	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CHCl_3$.	80A053
7.36	**1,1-Dichloroethylperoxyl**						
7.36.1	**Ascorbate ion**						
	$CH_3CCl_2OO\cdot + AH^- \rightarrow CH_3CCl_2OOH + \cdot A^-$	4.6×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,1-trichloroethane.	88A364
7.36.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CH_3CCl_2OO\cdot$ + ABTS $\rightarrow CH_3CCl_2OO^-$ + ABTS$\cdot^+$	4.3×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,1-trichloroethane.	88A364
7.36.3	**Bilirubin dianion**						
	$CH_3CCl_2OO\cdot + BR^{2-} \rightarrow CH_3CCl_2OO^- + BR\cdot^-$	6.0×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CH_3CCl_3 and bilirubin.	89A901
7.36.4	**Chlorpromazine, conjugate acid**						
	$CH_3CCl_2OO\cdot + CZH^+ \rightarrow CZ\cdot^+ + CH_3CCl_2OO^-$	7.4×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,1-trichloroethane.	88A364
		2.3×10^6		2-PrOH/ Water/ CH_3CCl_3	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 60% 2-PrOH and 10% CH_3CCl_3.	87A173
7.36.5	**Promethazine, conjugate acid**						
	$CH_3CCl_2OO\cdot + PZH^+ \rightarrow CH_3CCl_2OO^- + PZ\cdot^+$	3.7×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,1-trichloroethane.	88A364
7.36.6	**Propyl 3,4,5-trihydroxybenzoate**						
	$CH_3CCl_2OO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CH_3CCl_2OOH + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	8.0×10^7 7.3×10^8	5-6 8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,1-trichloroethane.	88A364
7.37	**1,2-Dichloroethylperoxyl**						
7.37.1	**Ascorbate ion**						
	$CH_2ClCHClOO\cdot + AH^- \rightarrow CH_2ClCHClOOH + \cdot A^-$	1.9×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloroethane.	88A364
7.37.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CH_2ClCHClOO\cdot$ + ABTS $\rightarrow CH_2ClCHClOO^-$ + ABTS$\cdot^+$	1.1×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloroethane.	88A364

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.37	**1,2-Dichloroethylperoxyl**—Continued						
7.37.3	**Bilirubin dianion**						
	$CH_2ClCHClOO\cdot + BR^{2-} \rightarrow CH_2ClCHClOO^- + BR\cdot^-$	1.9×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, $CH_2ClCHCl_2$ and bilirubin.	89A901
7.37.4	**Chlorpromazine, conjugate acid**						
	$CH_2ClCHClOO\cdot + CZH^+ \rightarrow CH_2ClCHClOO^- + CZ\cdot^+$	1.4×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloroethane.	88A364
7.37.5	**Promethazine, conjugate acid**						
	$CH_2ClCHClOO\cdot + PZH^+ \rightarrow CH_2ClCHClOO^- + PZ\cdot^+$	1.2×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloroethane.	88A364
7.37.6	**Propyl 3,4,5-trihydroxybenzoate**						
	$CH_2ClCHClOO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CH_2ClCHClOOH + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	3.6×10^8		Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloroethane.	88A364
7.38	**Dichloro(cyano)methylperoxyl**						
7.38.1	**Ascorbate ion**						
	$CCl_2(CN)OO\cdot + AH^- \rightarrow CCl_2(CN)OOH + \cdot A^-$	1.2×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and trichloroacetonitrile.	88A364
7.38.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CCl_2(CN)OO\cdot + ABTS \rightarrow CCl_2(CN)OO^- + ABTS\cdot^+$	5.8×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and trichloroacetonitrile.	88A364
7.38.3	**Chlorpromazine, conjugate acid**						
	$CCl_2(CN)OO\cdot + CZH^+ \rightarrow CCl_2(CN)OO^- + CZ\cdot^+$	9.1×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and trichloroacetonitrile.	88A364
7.38.4	**Promethazine, conjugate acid**						
	$CCl_2(CN)OO\cdot + PZH^+ \rightarrow CCl_2(CN)OO^- + PZ\cdot^+$	2.2×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and trichloroacetonitrile.	88A364
7.38.5	**Propyl 3,4,5-trihydroxybenzoate**						
	$CCl_2(CN)OO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CCl_2(CN)OOH + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	1.9×10^7 1.1×10^9	5-6 8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and trichloroacetonitrile.	88A364
7.39	**Carboxy(dichloro)methylperoxyl, anion**						
7.39.1	**Ascorbate ion**						
	$\cdot OOCCl_2CO_2^- + AH^- \rightarrow HOOCCl_2CO_2^- + \cdot A^-$	9.0×10^7	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 30% *tert*-BuOH, 0.01 mol L^{-1} phosphate buffer, and $CCl_3CO_2^-$.	80A053
7.39.2	**Promethazine, conjugate acid**						
	$\cdot OOCCl_2CO_2^- + PZH^+ \rightarrow {}^-OOCCl_2CO_2^- + PZ\cdot^+$	7.6×10^7 5.7×10^7	6 7	Water/ *tert*-BuOH	p.r.	P.b.k. at 510 nm in air-satd. soln. contg. 30% *tert*-BuOH, 0.01 mol L^{-1} phosphate buffer and $CCl_3CO_2^-$.	80A053
7.39.3	**Phenoxide ion**						
	$\cdot OOCCl_2CO_2^- + C_6H_5O^- \rightarrow {}^-OOCCl_2CO_2^- + C_6H_5O\cdot$	1.4×10^7	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CCl_3CO_2^-$	80A053

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.39	**Carboxy(dichloro)methylperoxyl, anion**—Continued						
7.39.4	**Tyrosine, negative ion**						
	$\cdot OOCCl_2CO_2^- + TyrO^- \rightarrow {}^-OOCCl_2CO_2^- + TyrO\cdot$	1.6×10^7	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and $CCl_3CO_2^-$	80A053
7.40	**Dichlorofluoromethylperoxyl**						
7.40.1	**Chlorpromazine, conjugate acid**						
	$CFCl_2OO\cdot + CZH^+ \rightarrow CZ\cdot^+ + CFCl_2OO^-$	1.2×10^8		2-PrOH/ Water/ $CFCl_3$	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 60% 2-PrOH and 10% $CFCl_3$.	87A173
7.41	**1,2-Dichloro-1,2,2-trifluoroethylperoxyl**						
7.41.1	**Ascorbate ion**						
	$CClF_2CClFOO\cdot + AH^- \rightarrow CClF_2CClFOOH + \cdot A^-$	6.9×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloro-1,2,2-trifluoroethane; mixed radicals including $CCl_2FCF_2OO\cdot$.	88A364
7.41.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CClF_2CClFOO\cdot + ABTS \rightarrow CClF_2CClFOOH + ABTS\cdot^+$	2.2×10^9	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloro-1,2,2-trifluoroethane; mixed radicals including $CCl_2FCF_2OO\cdot$.	88A364
7.41.3	**Chlorpromazine, conjugate acid**						
	$CClF_2CClFOO\cdot + CZH^+ \rightarrow CClF_2CClFOO^- + CZ\cdot^+$	1.8×10^9	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloro-1,2,2-trifluoroethane; mixed radicals including $CCl_2FCF_2OO\cdot$.	88A364
7.41.4	**Promethazine, conjugate acid**						
	$CClF_2CClFOO\cdot + PZH^+ \rightarrow CClF_2CClFOO^- + PZ\cdot^+$	1.2×10^9	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloro-1,2,2-trifluoroethane; mixed radicals including $CCl_2FCF_2OO\cdot$.	88A364
7.41.5	**Propyl 3,4,5-trihydroxybenzoate**						
	$CClF_2CClFOO\cdot + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow CClF_2CClFOOH + \cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	1.4×10^8 2.0×10^9	5-6 8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and 1,1,2-trichloro-1,2,2-trifluoroethane; mixed radicals including $CCl_2FCF_2OO\cdot$.	88A364
7.42	**Trichloromethylperoxyl**						
7.42.1	**Chlorite ion**						
	$CCl_3OO\cdot + ClO_2^- \rightarrow CCl_3OO^- + ClO_2\cdot$	1.4×10^7	7	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 40% 2-PrOH and 0.1 mol L^{-1} CCl_4.	86A291
7.42.2	**Iron(III) deuteroporphyrin, dimethyl ester**						
	$CCl_3OO\cdot + DPDMEFe^{III} \rightarrow CCl_3OO^- + [DPDMEFe^{III}]\cdot^+$	1.2×10^7		CCl_4	p.r.	P.b.k. at 660 nm in air-satd. soln.	84A178
7.42.3	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	$CCl_3OO\cdot + DPDMEFe^{III}(HOCH(CH_3)_2)_2 \rightarrow CCl_3OO^- + [DPDMEFe^{III}(HOCH(CH_3)_2)_2]\cdot^+$	2.3×10^8	<3	Water/ 2-PrOH	p.r.	P.b.k. at 660 nm in air-satd. soln. contg. 50% 2-PrOH, 0.2-0.3 mol L^{-1} CCl_4 and 2×10^{-3} mol L^{-1} $HClO_4$; $k = 2.5\text{-}2.6 \times 10^8$ in 0.23 and 1.16 mol L^{-1} $HClO_4$.	84A178

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	p.t	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.3	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**—Continued						
		$\sim 1 \times 10^7$		2-PrOH	p.r.	P.b.k. at 660 nm in air-satd. soln. contg. 0.2-0.3 mol L^{-1} CCl_4 and 2.3×10^{-3} mol L^{-1} $HClO_4$.	84A178
7.42.4	**Iron(III) deuteroporphyrin IX (2-propoxy)(2-propanol)**						
	$CCl_3OO\cdot$ + $DPFe^{III}OCH(CH_3)_2(HOCH(CH_3)_2)$ →	2.5×10^8	12.7	Water/ 2-PrOH	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 50% 2-PrOH, 0.2-0.3 mol L^{-1} CCl_4, and 0.05 mol L^{-1} NaOH.	84A178
7.42.5	**5,10,15,20-Tetraphenylporphinatogallium(III) ion**						
	$CCl_3OO\cdot$ + $GaTPP^+$ → CCl_3OO^- + $[GaTPP]\cdot^{2+}$	1.5×10^8		CCl_4	p.r.	P.b.k. at 700 nm in air-satd. CCl_4 soln. contg. GaTPP.	87A070
7.42.6	**2,3,7,8,12,13,17,18-Octaethylporphinato(carbonyl)cyanoruthenium(II) ion**						
	$CCl_3OO\cdot$ + $Ru(OEP)(CO)(CN)^+$ → CCl_3OO^- + $Ru(OEP\cdot^+)(CO)(CN)^+$	8×10^8		CH_3CN/ CCl_4	p.r.	P.b.k. in aerated soln. of acetonitrile/CCl_4 1:1 satd. with NaCN.	89A084
		1.5×10^9		CH_3CN/ CCl_4/ H_2O	p.r.	P.b.k. in aerated soln. of acetonitrile/CCl_4 1:1 contg. 10% water and NaCN.	89A084
7.42.7	**Sulfite ion**						
	$CCl_3OO\cdot$ + SO_3^{2-} → CCl_3OO^- + SO_3^-	8×10^6	8	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 40% 2-PrOH and 0.1 mol L^{-1} CCl_4; rel. to $k(CCl_3OO\cdot + 4\text{-}CH_3OC_6H_4OH) = 3.4 \times 10^6$.	86A291
7.42.8	**5,10,15,20-Tetraphenylporphinatozinc(II)**						
	$CCl_3OO\cdot$ + ZnTPP → CCl_3OO^- + $[ZnTPP]\cdot^+$	7.0×10^8		2-PrOH/ Water	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 68% 2-PrOH, CCl_4 and (1-4) $\times 10^{-4}$ mol L^{-1} porphyrin.	85A038
		1.2×10^9		CCl_4	p.r.	P.b.k. at 660 nm in CCl_4 soln. satd. with oxygen.	84A090
		1.7×10^9		CCl_4	p.r.	P.b.k. at 700 nm in air-satd. CCl_4 soln. contg. $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426
		1.6×10^9		Cyclohexane/ CCl_4	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 10% CCl_4 and $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426
		3.0×10^9		Cyclohexene/ CCl_4	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 10% CCl_4 and $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426
		1.2×10^9		Acetonitrile/ CCl_4	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 10% CCl_4 and $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426
		4.0×10^8		Acetone/ CCl_4	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 10% CCl_4 and $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426
		2.6×10^8		2-PrOH/ CCl_4	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 10% CCl_4 and $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426
		7.7×10^7		DMSO/ CCl_4	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 10% CCl_4 and $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426
7.42.9	**5,10,15,20-Tetraphenylporphinatozinc(II) pyridine complex**						
	$CCl_3OO\cdot$ + ZnTPP(py) → CCl_3OO^- + $[ZnTPP(py)]\cdot^+$	3.5×10^7		Cyclohexane/ CCl_4	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 10% CCl_4, 1% pyridine and $3\text{-}30 \times 10^{-5}$ mol L^{-1} ZnTPP.	86A426

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.10	**5,10,15,20-Tetrakis(4-pyridyl)porphinatozinc(II)**						
	$CCl_3OO\cdot$ + ZnTpyP → CCl_3OO^- + $[ZnTpyP]^{\cdot+}$	2.0×10^7		2-PrOH/ Water	p.r.	P.b.k. at 700 nm in air-satd. soln. contg. 68% 2-PrOH, CCl_4 and (1-4) × 10^{-4} mol L^{-1} porphyrin.	85A038
7.42.11	**5,10,15,20-Tetrakis(1-methylpyridinium-4-yl)porphinatozinc(II) ion**						
	$CCl_3OO\cdot$ + $ZnTMpyP^{4+}$ → CCl_3OO^- + $[ZnTMpyP]^{\cdot5+}$	1.5×10^7		Water/ 2-PrOH	p.r.	P.b.k. at 690-700 nm in air-satd. soln. contg. 50% 2-PrOH, CCl_4 and (1-4) × 10^{-4} mol L^{-1} porphyrin.	85A038
7.42.12	**5,10,15,20-Tetrakis(2-hydroxyphenyl)porphinatozinc(II)**						
	$CCl_3OO\cdot$ + ZnT(o-HOP)P → CCl_3OO^- + $[ZnT(o\text{-}HOP)P]^{\cdot+}$	1.2×10^9	7	Water/ 2-PrOH	p.r.	P.b.k. at 680 nm in air-satd.soln. contg. ~50% 2-PrOH, ~2% CCl_4 and 2 × 10^{-3} mol L^{-1} phosphate buffer.	86A242
7.42.13	**5,10,15,20-Tetrakis(3-hydroxyphenyl)porphinatozinc(II)**						
	$CCl_3OO\cdot$ + ZnT(m-HOP)P → CCl_3OO^- + $[ZnT(m\text{-}HOP)P]^{\cdot+}$	1.5×10^9	7	Water/ 2-PrOH	p.r.	P.b.k. at 680 nm in air-satd. soln. contg. ~50% 2-PrOH, ~2% CCl_4 and 2 × 10^{-3} mol L^{-1} phosphate buffer.	86A242
7.42.14	**5,10,15,20-Tetrakis(4-hydroxyphenyl)porphinatozinc(II)**						
	$CCl_3OO\cdot$ + ZnT(p-HOP)P → CCl_3OO^- + $[ZnT(p\text{-}HOP)P]^{\cdot+}$	1.7×10^9	7	Water/ 2-PrOH	p.r.	P.b.k. at 680 nm in air-satd. soln. contg. ~50% 2-PrOH, ~2% CCl_4 and 2 × 10^{-3} mol L^{-1} phosphate buffer.	86A242
7.42.15	**5,10,15,20-Tetrakis(4-sulfonatophenyl)porphinatozincate(II) ion**						
	$CCl_3OO\cdot$ + $ZnTPPS^{4-}$ → CCl_3OO^- + $[ZnTPPS]^{\cdot3-}$	7.0×10^8		Water/ 2-PrOH	p.r.	P.b.k. at 600-700 nm in air satd. soln. contg. 45% 2-PrOH, CCl_4 and (1-4) × 10^{-4} mol L^{-1} porphyrin.	85A038
7.42.16	**Arachidonic acid**						
	$CCl_3OO\cdot$ + $CH_3(CH_2)_3(CH_2CH{=}CH)_4(CH_2)_3CO_2H$ →	7.3×10^6		Water/ *tert*-BuOH	p.r.	C.k. in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} CCl_4; rel. to $k(CCl_3OO\cdot + ABTS) = 1.9 \times 10^9$.	83A364
7.42.17	**Ascorbate ion**						
	$CCl_3OO\cdot$ + AH^- → CCl_3OOH + $\cdot A^-$	9.1×10^8	7	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 5% 2-PrOH and 0.02% CCl_4.	89A165
		2.0×10^8	7	Water/ *tert*-BuOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 30% *tert*-BuOH and 0.01 mol L^{-1} phosphate buffer and CCl_4 (measured in two different laboratories).	80A053
		1.6×10^8	7				
		1.1×10^8		Water/ 2-PrOH	p.r.	P.b.k. *in oxygen-satd. soln. contg.* 48% 2-PrOH and 4% CCl_4.	89A019
		5.8×10^8	7	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 12% and 50% 2-PrOH, respectively, and 1% CCl_4.	89A384
		1.3×10^8					
		1.1×10^8	7	2-PrOH/ Water	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 67% 2-PrOH and 10% CCl_4.	89A384
7.42.18	**Ascorbic acid**						
	$CCl_3OO\cdot$ + AH_2 → CCl_3OOH + $\cdot A^-$	1.4×10^7	1	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 12%, 30% and 50% 2-PrOH, respectively, and 1% CCl_4.	89A384
		9.9×10^6					
		3.1×10^6					

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.18	**Ascorbic acid**—Continued						
		1.8×10^6	1	2-PrOH/ Water	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 67% 2-PrOH and 10% CCl_4.	89A384
7.42.19	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CCl_3OO\cdot$ + ABTS → CCl_3OO^- + $ABTS\cdot^+$	1.2×10^9		Water/ 2-PrOH/ Acetone	p.r.	P.b.k. at 415 nm in air-satd. soln. contg. 33% 2-PrOH, 16% acetone, 0.1 mol L^{-1} CCl_4, and ABTS.	84A266
		1.9×10^9	6.6	Water/ *tert*-BuOH	p.r.	P.b.k. at 415 nm in air-satd. soln. contg. 20% *tert*-BuOH and 10^{-2} mol L^{-1} CCl_4.	82A196
7.42.20	**Bilirubin dianion**						
	$CCl_3OO\cdot$ + BR^{2-} → CCl_3OO^- + $BR\cdot^-$	2.2×10^9	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CCl_4 and bilirubin.	89A901
7.42.21	**3-*tert*-Butyl-4-hydroxyanisole**						
	$CCl_3OO\cdot$ + ArOH → ArO· + CCl_3OOH	3.8×10^7		CCl_4	p.r.	P.b.k. in air-satd. soln.	82Z341
7.42.22	**β-Carotene**						
	$CCl_3OO\cdot$ + car → CCl_3OO^- + $car\cdot^+$	1.5×10^9		Water/ *tert*-BuOH	p.r.	D.k. at 450 and 500 nm in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} CCl_4.	81A036
7.42.23	**Chlorpromazine, conjugate acid**						
	$CCl_3OO\cdot$ + CZH^+ → $CZ\cdot^+$ + CCl_3OO^-	1.9×10^7		2-PrOH/ CCl_4	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 50% CCl_4.	87A173
		2.9×10^7		2-PrOH/ CCl_4	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 10% CCl_4.	87A173
		7.2×10^7		2-PrOH/ Water/ CCl_4	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 60% 2-PrOH, and 10% CCl_4.	87A173
		6.7×10^8		Water/ 2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 33% 2-PrOH, and 0.5% CCl_4.	87A173
		1.0×10^9		Water/ 2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 11% 2-PrOH, and 0.1% CCl_4.	87A173
		5.7×10^8	5.4	Water/ 2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 40% 2-PrOH and CCl_4.	87A480
		1.5×10^9	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and carbon tetrachloride.	88A364
7.42.24	**Cholesterol**						
	$CCl_3OO\cdot$ + $C_{27}H_{46}O$ →	~6×10^5	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% CCl_4, 0.1 mol L^{-1} $HClO_4$ and 0.5-1 × 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; rel. to $k(CCl_3OO\cdot$ + $DPDMEFe^{III}) = 2.5 \times 10^9$.	85A341
7.42.25	**Cyclohexane**						
	$CCl_3OO\cdot$ + c-C_6H_{12} →	1×10^3		CCl_4	p.r.	C.k. in air-satd. CCl_4 soln. contg. cyclohexane; rel. to $k(CCl_3OO\cdot$ + $ZnTPP(py) = 3.5 \times 10^7$.	87A070

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.26	**Cyclohexene**						
	$CCl_3OO\cdot$ + c-C_6H_{10} →	1×10^5		CCl_4	p.r.	C.k. in air-satd. CCl_4 soln. contg. cyclohexene; rel. to $k(CCl_3OO\cdot$ + GaTPP) = 1.5×10^8.	87A070
7.42.27	**2'-Deoxyadenosine 5'-monophosphate**						
	$CCl_3OO\cdot$ + dAMP →	$<1 \times 10^5$	7	Water/ 2-PrOH	p.r.		87C024
7.42.28	**Deoxyguanosine 5'-monophosphate**						
	$CCl_3OO\cdot$ + dGMP →	$\sim 6 \times 10^5$	7	Water/ 2-PrOH	p.r.		87C024
7.42.29	**1,4-Diazabicyclo[2.2.2]octane**						
	$CCl_3OO\cdot$ + DABCO → CCl_3OO^- + DABCO$\cdot^+$	1.2×10^7		Water/ *tert*-BuOH	p.r.	P.b.k. at 270 and 460 nm in air-satd. soln. contg. 40% *tert*-BuOH and 0.1 mol L^{-1} CCl_4.	81A036
7.42.30	**9-Diazofluorene**						
	$CCl_3OO\cdot$ + $C_{13}H_8N_2$ →	1.2×10^7		Water/ 2-PrOH/ Acetone	p.r.	C.k. in air-satd. soln. contg. 33% 2-PrOH and 16% acetone; rel. to $k(CCl_3OO\cdot$ + ABTS) = 1.2×10^9.	84A266
7.42.31	**2,6-Di-*tert*-butyl-4-methylphenol**						
	$CCl_3OO\cdot$ + DTBMPhOH → DTBMPhO$\cdot$ + CCl_3OOH	6.1×10^6		CCl_4	p.r.	P.b.k. in air-satd. soln.	82A452
7.42.32	**2,4-Di-*tert*-butylphenol**						
	$CCl_3OO\cdot$ + $[(CH_3)_3C]_2C_6H_3OH$ → $[(CH_3)_3C]_2C_6H_3O\cdot$ + CCl_3OOH	2.7×10^6		CCl_4	p.r.	P.b.k. in air-satd. soln.	82A452
7.42.33	**2,3-Dimethyl-4-dimethylamino-1-phenyl-3-pyrazolin-5-one**						
	$CCl_3OO\cdot$ + AP → CCl_3OO^- + AP$\cdot^+$	4.9×10^8	~6	Water	p.r.	P.b.k. in air-satd. soln. contg. *tert*-BuOH and CCl_4.	88A305
7.42.34	**2,3-Dimethylindole**						
	$CCl_3OO\cdot$ + 2,3-Me_2InH →	1.2×10^9		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4; reaction mainly by radical addn.; one-electron oxidation is 32% in neutral, 28% in basic, 89% in acidic soln.	89A208
7.42.35	**2,3-Dimethyl-1-phenyl-3-pyrazolin-5-one**						
	$CCl_3OO\cdot$ + AT →		~6	Water	p.r.	No reaction obs.; air-satd. soln. contg. *tert*-BuOH and CCl_4.	88A305
7.42.36	**3,4-Dimethyl-2-pyrazolin-5-one**						
	$CCl_3OO\cdot$ + DMPZO → [DMPZO]$\cdot$ + CCl_3OOH	4.3×10^7	7.0	Water	p.r.	P.b.k. in air-satd. soln. contg. CCl_4; pK_a = 8.9.	85A390
7.42.37	**Dimethyl sulfide**						
	$CCl_3OO\cdot$ + CH_3SCH_3 → CCl_3OO^- + $(CH_3)_2S\cdot^+$	1.3×10^8		Water/ *tert*-BuOH	p.r.	P.b.k. at 465 nm in air-satd. soln. contg. 30% *tert*-BuOH, 3×10^{-2} mol L^{-1} CCl_4 and 10^{-4}-10^{-2} mol L^{-1} sulfide.	85A123
7.42.38	**2,5-Diphenylfuran**						
	$CCl_3OO\cdot$ + DPF → CCl_3OO^- + DPF$\cdot^+$	6×10^7		Water/ *tert*-BuOH	p.r.	P.b.k. at 410 and 465 nm in air-satd. soln. contg. 40% *tert*-BuOH and 0.1 mol L^{-1} CCl_4.	81A036
7.42.39	**Ethyl 2-hydroxyethyl sulfide**						
	$CCl_3OO\cdot$ + $C_2H_5SCH_2CH_2OH$ → CCl_3OO^- + $[C_2H_5SCH_2CH_2OH]\cdot^+$	4.0×10^7		Water/ 2-PrOH	p.r.	P.b.k. at 480 nm in air-satd. soln. contg. 30% 2-PrOH, 3×10^{-2} mol L^{-1} CCl_4 and 10^{-4}-10^{-2} mol L^{-1} sulfide.	85A123

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.40	**1-Ethylthio-3-iodopropane**						
	$CCl_3OO\cdot + C_2H_5S(CH_2)_3I \rightarrow [C_2H_5S(CH_2)_3I]^{\cdot+} + CCl_3OO^-$	1.4×10^8	4	Water/ 2-PrOH	p.r.	P.b.k. in air-satd. soln. contg. 30% 2-PrOH and 0.1% CCl_4.	88B057
7.42.41	**Glutathione**						
	$CCl_3OO\cdot + GSH \rightarrow$	3×10^6	7	Water	p.r.	C.k.; rel. to $k(CCl_3OO\cdot + TrpH) = 8.9 \times 10^7$.	88A251
7.42.42	**Hexamethylbenzene**						
	$CCl_3OO\cdot + C_6(CH_3)_6 \rightarrow CCl_3OOH + C_6(CH_3)_5(\dot{C}H_2)$	7.5×10^4		CCl_4	p.r.	C.k. in air-satd. CCl_4 soln. contg. hexamethylbenzene; rel. to $k(CCl_3OO\cdot + GaTPP) = 1.5 \times 10^8$.	87A070
7.42.43	**Histidine**						
	$CCl_3OO\cdot + His \rightarrow$	2.5×10^6	7	Water	p.r.	C.k.; rel. to $k(CCl_3OO\cdot + TrpH) = 8.9 \times 10^7$.	88A251
7.42.44	**Hydroquinone**						
	$CCl_3OO\cdot + 1,4\text{-}C_6H_4(OH)_2 \rightarrow CCl_3OOH + 4\text{-}^-OC_6H_4O\cdot + H^+$	1.0×10^7	7	Water/ 2-PrOH	p.r.	P.b.k. at 430 nm in air-satd. soln. contg. 40% 2-PrOH and 0.1 mol L^{-1} CCl_4.	86A291
		6.5×10^6		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4.	89A019
		4.1×10^7		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 25% 2-PrOH and 4% CCl_4.	89A019
7.42.45	**6-Hydroxy-1,4-dimethylcarbazole**						
	$CCl_3OO\cdot + C_{14}H_{13}NO \rightarrow$	8.3×10^8		Water	p.r.		83A392
7.42.46	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion**						
	$CCl_3OO\cdot + TxOH^- \rightarrow CCl_3OO^- + HTxO\cdot$	5.8×10^8	~4	Water	p.r.	P.b.k. at 420 nm in air/CCl_4 satd. soln.	89A384
		3.7×10^8	7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH, 10^{-2} mol L^{-1} CCl_4 and 0.01 mol L^{-1} Trolox C.	88A436
		3.2×10^8 4.5×10^8 3.6×10^8	~4	Water/ MeOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10%, 25% and 50% MeOH, respectively, and 1% CCl_4.	89A384
		1.3×10^8	~4	MeOH/ Water	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 75% MeOH and 1% CCl_4.	89A384
		3.2×10^8 1.6×10^8	~4	Water/ 2-PrOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 20% and 50% 2-PrOH, respectively, and 1% CCl_4.	89A384
		4.8×10^7	~4	2-PrOH/ Water	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 80% 2-PrOH and 1% CCl_4.	89A384
		6.2×10^8 4.0×10^8 2.6×10^8	~4	Water/ Dioxane	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10%, 30% and 50% dioxane, respectively, and 1% CCl_4.	89A384
		7×10^7	~4	Dioxane/ Water	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 90% dioxane and 1% CCl_4.	89A384
		2.7×10^8		Formamide	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 1% CCl_4.	89A384
		8.0×10^7		Pyridine	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
		4.6×10^7		Ethylene glycol	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 3% CCl_4.	89A384

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.46	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion**—Continued						
		4.6×10^7		CCl_4	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 5% acetone.	89A384
		3.1×10^7		MeOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 1% CCl_4.	89A384
		2.1×10^7		2-PrOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
		2.1×10^7		*tert*-BuOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
		2.1×10^7		Dimethyl-formamide	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
		1.5×10^7		Dioxane	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
		1.4×10^7		Ethyl ether	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
		1.2×10^7		CH_3CN	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
		9.2×10^6		Acetone	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 10% CCl_4.	89A384
7.42.47	**5-Hydroxytryptophan, conjugate base**						
	$CCl_3OO\cdot$ + 5-$^-$OTrpH → CCl_3OO^- + ·OTrpH	6.0×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 40% 2-PrOH and 0.1 mol L^{-1} CCl_4.	86A291
7.42.48	**5-Hydroxytryptophan**						
	$CCl_3OO\cdot$ + 5-OHTrpH →	1.5×10^8	7	Water/ 2-PrOH	p.r.		87C024
7.42.49	**Indole**						
	$CCl_3OO\cdot$ + InH →	1.0×10^8		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4; reaction mainly by radical addn.; one-electron oxidation is 15% in neutral, 17% in basic, 69% in acidic soln.	89A208
7.42.50	**Isobarbiturate ion**						
	$CCl_3OO\cdot$ + IBO^- →	6.5×10^7	7	Water/ 2-PrOH	p.r.		87C024
7.42.51	**Linoleic acid**						
	$CCl_3OO\cdot$ + LH →	3.9×10^6		Water/ *tert*-BuOH	p.r.	C.k. in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} CCl_4; rel. to $k(CCl_3OO\cdot + ABTS) = 1.9 \times 10^9$.	83A364
		5×10^5	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% CCl_4, 0.1 mol L^{-1} $HClO_4$, and 0.5-1 $\times$ 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; rel. to $k(CCl_3OO\cdot + DPDMEFe^{III}) = 2.5 \times 10^8$.	85A341
7.42.52	**Linolenic acid**						
	$CCl_3OO\cdot$ + $CH_3(CH_2CH{=}CH)_3(CH_2)_7CO_2H$ →	7.0×10^6		Water/ *tert*-BuOH	p.r.	C.k. in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} CCl_4; rel. to $k(CCl_3OO\cdot + ABTS) = 1.9 \times 10^9$.	83A364

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.52	**Linolenic acid** –Continued						
		1.1×10^6	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% CCl_4, 0.1 mol L^{-1} $HClO_4$, and 0.5-1 $\times$ 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; rel. to $k(CCl_3OO\cdot + DPDMEFe^{III}) = 2.5 \times 10^8$.	85A341
7.42.53	**Methionine**						
	$CCl_3OO\cdot$ + Met →	2.9×10^7	10	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 30% 2-PrOH, 3×10^{-2} mol L^{-1} CCl_4 and 10^{-4}-10^{-2} mol L^{-1} methionine; rel. to $k(CCl_3OO\cdot$ + ABTS) $= 1.9 \times 10^9$.	85A123
7.42.54	**4-Methoxybenzenethiol**						
	$CCl_3OO\cdot + CH_3OC_6H_4SH \rightarrow CCl_3OOH + CH_3OC_6H_4S\cdot$	5×10^7	3-6	Water/ 2-PrOH	p.r.	P.b.k. at 530 nm in air-satd. soln. contg. 23% 2-PrOH, 0.7 mol L^{-1} acetone and 2.0×10^{-2} mol L^{-1} CCl_4; pH dependent; pK_a of thiol = 6.8.	86A550
7.42.55	**4-Methoxybenzenethiolate ion**						
	$CCl_3OO\cdot + CH_3OC_6H_4S^- \rightarrow CCl_3OO^- + CH_3OC_6H_4S\cdot$	8.2×10^8	10-12	Water/ 2-PrOH	p.r.	P.b.k. at 530 nm in air-satd. soln. contg. 23% 2-PrOH, 0.7 mol L^{-1} acetone and 2.0×10^{-2} mol L^{-1} CCl_4; pH dependent.	86A550
7.42.56	**4-Methoxyphenol**						
	$CCl_3OO\cdot + 4\text{-}CH_3OC_6H_4OH \rightarrow CCl_3OOH + 4\text{-}CH_3OC_6H_4O\cdot$	3.4×10^6	7	Water/ 2-PrOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 40% 2-PrOH and 0.1 mol L^{-1} CCl_4.	86A291
		$<8 \times 10^6$		CCl_4	p.r.	P.b.k. at 420 nm in oxygen-satd. CCl_4 soln.	84A090
7.42.57	**4-Methoxyphenoxide ion**						
	$CCl_3OO\cdot + 4\text{-}CH_3OC_6H_4O^- \rightarrow CCl_3OO^- + 4\text{-}CH_3OC_6H_4O\cdot$	8.2×10^8	11-12	Water	p.r.	P.b.k. at 390-430 nm in air-satd. soln. contg. 5% acetone and 5% 2-PrOH, satd. with CCl_4.	89A384
7.42.58	**1-Methylindole**						
	$CCl_3OO\cdot$ + 1-MeIn →	1.1×10^8		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4; reaction is 51% one-electron oxidation as well as radical addn.	89A208
7.42.59	**2-Methylindole**						
	$CCl_3OO\cdot$ + 2-MeInH →	6×10^8		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4; reaction is mainly by radical addn.; one-electron oxidation is 26% in neutral, 27% in basic, and 58% in acidic soln.	89A208
7.42.60	**3-Methylindole**						
	$CCl_3OO\cdot$ + 3-MeInH →	9×10^8		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4; reaction is mainly by radical addn.; one-electron oxidation is 17% in neutral or basic, and 77% in acidic soln.	89A208
7.42.61	**Methyl 6-(methylthio)norbornane-2-carboxylate**						
	$CCl_3OO\cdot + CH_3S(NB)CO_2CH_3 \rightarrow CCl_3OO^- + R_2S\cdot^+$	2×10^7		Water/ *tert*-BuOH	p.r.	P.b.k. at 490 nm in air-satd. soln. contg. 30% *tert*-BuOH and 1% CCl_4.	87B097

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.62	**Methyl 3-(methylthio)propionate**						
	$CCl_3OO\cdot + CH_3SCH_2CH_2CO_2CH_3 \rightarrow CCl_3OO^- + [CH_3SCH_2CH_2CO_2CH_3]\cdot^+$	7×10^7		Water/ *tert*-BuOH	p.r.	P.b.k. at 490 nm in air-satd. soln. contg. 30% *tert*-BuOH and 1% CCl_4.	87B097
7.42.63	**4-Methylphenoxide ion**						
	$CCl_3OO\cdot + 4\text{-}CH_3C_6H_4O^- \rightarrow CCl_3OO^- + 4\text{-}CH_3C_6H_4O\cdot$	2.2×10^8	11-12	Water	p.r.	P.b.k. at 390-430 nm in air-satd. soln. contg. 5% acetone and 5% 2-PrOH, satd. with CCl_4; $k_H/k_D = 2.0$.	89A384
7.42.64	**6-(Methylthio)norbornane-2-carboxylic acid**						
	$CCl_3OO\cdot + CH_3S(NB)CO_2H \rightarrow CCl_3OO^- + R_2S\cdot^+$	3×10^8		Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 30% *tert*-BuOH and 1% CCl_4.	87B097
7.42.65	**3-(Methylthio)propionic acid**						
	$CCl_3OO\cdot + CH_3SCH_2CH_2CO_2H \rightarrow CCl_3OO^- + R_2S\cdot^+$	1×10^8		Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 30% *tert*-BuOH and 1% CCl_4.	87B097
7.42.66	**1-Methyluracil**						
	$CCl_3OO\cdot + 1\text{-MeU} \rightarrow$	$<1 \times 10^5$	7	Water/ 2-PrOH	p.r.		87C024
7.42.67	**Metiazinic acid, conjugate base**						
	$CCl_3OO\cdot + MZ^- \rightarrow CCl_3OO^- + MZ\cdot$	1.3×10^9		Water/ 2-PrOH/ Acetone	p.r.	P.b.k. at 530 nm in air-satd. soln. contg. 30% 2-PrOH, 10% acetone, and 0.04 mol L^{-1} CCl_4.	83G216
7.42.68	**Oleic acid**						
	$CCl_3OO\cdot + CH_3(CH_2)_7CH{=}CH(CH_2)_7CO_2H \rightarrow$	1.7×10^6		Water/ *tert*-BuOH	p.r.	C.k. in air-satd. soln. contg. 50% *tert*-BuOH and 0.1 mol L^{-1} CCl_4; rel. to $k(CCl_3OO\cdot + ABTS) = 1.9 \times 10^9$.	83A364
		4×10^5	1	Water/ 2-PrOH	p.r.	C.k. in air-satd. soln. contg. 50% 2-PrOH, 2-3% CCl_4, 0.1 mol L^{-1} $HClO_4$, and 0.5-1 $\times 10^{-4}$ mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; rel. to $k(CCl_3OO\cdot + DPDMEFe^{III}) = 2.5 \times 10^8$.	85A341
7.42.69	**Phenol**						
	$CCl_3OO\cdot + C_6H_5OH \rightarrow CCl_3OOH + C_6H_5O\cdot$	$<1 \times 10^5$	7	Water/ 2-PrOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 40% 2-PrOH and CCl_4.	87A480
		$<7.5 \times 10^4$		CCl_4	p.r.	P.b.k. at 400 nm in oxygen-satd. CCl_4 soln.	84A090
7.42.70	**Phenoxide ion**						
	$CCl_3OO\cdot + C_6H_5O^- \rightarrow CCl_3OO^- + C_6H_5O\cdot$	2.3×10^8	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and CCl_4.	80A053
		2.0×10^8		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4.	89A019
		9.6×10^6	11-12	Water	p.r.	P.b.k. at 390-430 nm in air-satd. soln. contg. 5% acetone and 5% 2-PrOH, satd. with CCl_4.	89A384
7.42.71	**Promethazine, conjugate acid**						
	$CCl_3OO\cdot + PZH^+ \rightarrow CCl_3OO^- + PZ\cdot^+$	6.0×10^8	6	Water/ *tert*-BuOH	p.r.	P.b.k. at 510 nm in air-satd. soln. contg. 30% *tert*-BuOH, 0.01 mol L^{-1} phosphate buffer and CCl_4.	80A053
		4.5×10^8	7				
		1.4×10^8	4	Water	p.r.	P.b.k. at 510 nm in air-satd. soln. contg. 5% acetone and 5% 2-PrOH, satd. with CCl_4; $k_H/k_D = 1.8$.	89A384

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.72	**2-Propanol**						
	$CCl_3OO\cdot$ + $(CH_3)_2CHOH$ →	$<7 \times 10^3$		Water/ 2-PrOH	p.r.	Competition with p.b.k. at 520 nm of tryptophan radical in air-satd. 50% 2-PrOH soln. contg. 0.1 mol L^{-1} CCl_4 and tryptophan.	81A058
7.42.73	**Propyl 3,4,5-trihydroxybenzoate**						
	$CCl_3OO\cdot$ + $(HO)_3C_6H_2CO_2C_3H_7$ →	2.0×10^7	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 10% *tert*-BuOH and carbon tetrachloride.	88A364
	CCl_3OOH + $\cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	1.3×10^9	8-9				83A392
7.42.74	**Pyridine**						
	$CCl_3OO\cdot$ + py →	7×10^3		CCl_4	p.r.	C.k. in air-satd. CCl_4 soln. contg. pyridine; rel. to $k(CCl_3OO\cdot$ + ZnTPP(py)) = 3.5×10^7.	87A070
7.42.75	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$CCl_3OO\cdot$ + TMPD → CCl_3OOH + $TMPD\cdot^+$ + OH^-	1.7×10^9	~8	Water	p.r.	P.b.k at 565 nm in Ar/O_2 (4:1) satd. soln. contg. CCl_4.	89A165
		7.8×10^8		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4.	89A019
		2.1×10^9		CCl_4	p.r.	P.b.k. in CCl_4 soln. satd. with oxygen.	84A090
7.42.76	**3,3'-Thiodipropionic acid**						
	$CCl_3OO\cdot$ + $S(CH_2CH_2CO_2H)_2$ →	$<1 \times 10^6$		Water/ *tert*-BuOH	p.r.	P.b.k. in soln. contg. 30% *tert*-BuOH and 1% CCl_4.	87B097
7.42.77	**α-Tocopherol**						
	$CCl_3OO\cdot$ + ArOH → ArO· + CCl_3OO^-	5×10^8		2-PrOH/ Water/ Acetone	p.r.	P.b.k. in air-satd. soln. contg. 50% 2-PrOH, 10% acetone and 0.04 mol L^{-1} CCl_4.	79A084
		1.8×10^8		CCl_4	p.r.	P.b.k. in air-satd. CCl_4 soln.	82A452 82Z341
7.42.78	**2,4,6-Trimethylphenoxide ion**						
	$CCl_3OO\cdot$ + 2,4,6-$Me_3C_6H_2O^-$ → CCl_3OOH + 2,4,6-$Me_3C_6H_2O\cdot$	7.6×10^8		Water/ 2-PrOH	p.r.	P.b.k. in oxygen-satd. soln. contg. 48% 2-PrOH and 4% CCl_4.	89A019
7.42.79	**Trypsin**						
	$CCl_3OO\cdot$ + Tryp →	3×10^8	7	Water	p.r.		88A251
7.42.80	**Tryptophan**						
	$CCl_3OO\cdot$ + TrpH →	8.9×10^7	7	Water	p.r.		88A251
		8.5×10^7	7	Water/ 2-PrOH	p.r.	P.b.k. at 520 nm in air-satd. 50% 2-PrOH soln. contg. 0.1 mol L^{-1} CCl_4; major product is radical adduct; one-electron oxidation is 24% in basic soln. [89A208].	81A058
7.42.81	**Tryptophyltyrosine**						
	$CCl_3OO\cdot$ + TrpHTyrOH →	1.7×10^7		2-PrOH	p.r.	P.b.k. at 450 nm in air-satd. 2-PrOH contg. acetone and CCl_4	86A110
7.42.82	**Tyrosine**						
	$CCl_3OO\cdot$ + TyrOH →	$<1 \times 10^4$	7	Water	p.r.		88A251
7.42.83	**Tyrosine, negative ion**						
	$CCl_3OO\cdot$ + $TyrO^-$ → CCl_3OO^- + TyrO·	1.6×10^8	12	Water/ 2-PrOH/ Acetone	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 15% 2-PrOH, 7% acetone, 0.01 mol L^{-1} CCl_4.	78B128
		1.3×10^8	12	Water/ *tert*-BuOH	p.r.	P.b.k. at 400 nm in air-satd. soln. contg. 30% *tert*-BuOH and CCl_4.	80A053

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.42	**Trichloromethylperoxyl**—Continued						
7.42.84	**Urate ion**						
	$CCl_3OO\cdot$ + UrO^- → CCl_3OO^- + $UrO\cdot$	1.4×10^9 1.3×10^9 1.2×10^9	13	Water/ MeOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 10%, 25% and 50% MeOH, respectively, and 1% CCl_4.	89A384
		1.2×10^9	13	MeOH/ Water	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 80% MeOH and 1% CCl_4.	89A384
		2.7×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 40% 2-PrOH and 0.1 mol L^{-1} CCl_4.	86A291
		3.0×10^8	7	Water/ 2-PrOH	p.r.		87C024
		1.5×10^9 7.0×10^8 1.9×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 10%, 28% and 50% 2-PrOH, respectively, and 1% CCl_4.	89A384
		1.2×10^8	13	2-PrOH/ Water	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 67% 2-PrOH and 10% CCl_4.	89A384
7.42.85	**Xanthine, negative ion**						
	$CCl_3OO\cdot$ + XO^- → CCl_3OO^- + $XO\cdot$	1.1×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 350 nm in air-satd. soln. contg. 40% 2-PrOH and 0.1 mol L^{-1} CCl_4.	86A291
7.43	**1,2,2-Trichloroethylperoxyl**						
7.43.1	**Bilirubin dianion**						
	$CHCl_2CHClOO\cdot$ + BR^{2-} → $CHCl_2CHClOO^-$ + $BR\cdot^-$	2.6×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, $CHCl_2CHCl_2$ and bilirubin.	89A901
7.44	**Pentachloroethylperoxyl**						
7.44.1	**Ascorbate ion**						
	$CCl_3CCl_2OO\cdot$ + AH^- → CCl_3CCl_2OOH + $\cdot A^-$	$>4 \times 10^7$	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH and hexachloroethane.	88A364
7.44.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	$CCl_3CCl_2OO\cdot$ + ABTS → $CCl_3CCl_2OO^-$ + $ABTS\cdot^+$	4.3×10^8	~7	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH and hexachloroethane.	88A364
7.44.3	**Chlorpromazine, conjugate acid**						
	$CCl_3CCl_2OO\cdot$ + CZH^+ → $CZ\cdot^+$ + $CCl_3CCl_2OO^-$	4.2×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH and hexachloroethane.	88A364
		8.6×10^7		2-PrOH/ Water/ CCl_3CCl_3	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 60% 2-PrOH and 10% CCl_3CCl_3	87A173
7.44.4	**Promethazine, conjugate acid**						
	$CCl_3CCl_2OO\cdot$ + PZH^+ → $CCl_3CCl_2OO^-$ + $PZ\cdot^+$	1.7×10^8	5-6	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH and hexachloroethane.	88A364
7.44.5	**Propyl 3,4,5-trihydroxybenzoate**						
	$CCl_3CCl_2OO\cdot$ + $(HO)_3C_6H_2CO_2C_3H_7$ → CCl_3CCl_2OOH + $\cdot O(OH)(O^-)C_6H_2CO_2C_3H_7$	3.2×10^8	8-9	Water/ *tert*-BuOH	p.r.	P.b.k. in air-satd. soln. contg. 40% *tert*-BuOH and hexachloroethane.	88A364

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.45	**Bromomethylperoxyl**						
7.45.1	**Ascorbate ion**						
	$CH_2BrOO\cdot + AH^- \rightarrow CH_2BrOOH + \cdot A^-$	1.5×10^8	8	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 5% 2-PrOH and 0.02% CH_2Br_2.	89A165
7.45.2	**Bilirubin dianion**						
	$CH_2BrOO\cdot + BR^{2-} \rightarrow CH_2BrOO^- + BR\cdot^-$	3.8×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, 2.8×10^{-2} mol L^{-1} CH_2Br_2 and $0.6\text{-}1.0 \times 10^{-3}$ mol L^{-1} bilirubin.	89A901
7.46	**Dibromomethylperoxyl**						
7.46.1	**Bilirubin dianion**						
	$CHBr_2OO\cdot + BR^{2-} \rightarrow CHBr_2OO^- + BR\cdot^-$	5.9×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, $CHBr_3$ and bilirubin.	89A901
7.47	**Tribromomethylperoxyl**						
7.47.1	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	$CBr_3OO\cdot + DPDMEFe^{III}(HOCH(CH_3)_2)_2 + DPFe^{III} \rightarrow CBr_3OO^- + [DPDMEFe^{III}(HOCH(CH_3)_2)_2]\cdot^+$	2.8×10^8	~1	Water/ 2-PrOH	p.r.	P.b.k. at 660 nm in air-satd. soln. contg. 50% 2-PrOH, 10^{-2} mol L^{-1} CBr_4 and 0.1 mol L^{-1} $HClO_4$.	87A232
7.47.2	**Ascorbate ion**						
	$CBr_3OO\cdot + AH^- \rightarrow CBr_3OOH + \cdot A^-$	5.0×10^8	7	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 20% 2-PrOH and 0.01% CBr_4.	89A165
		2.1×10^8	7	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 40% 2-PrOH and CBr_4.	87A480
		1.7×10^8	7	2-PrOH/ Water	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 70% 2-PrOH and 1% CBr_4.	89A384
7.47.3	**Bilirubin dianion**						
	$CBr_3OO\cdot + BR^{2-} \rightarrow CBr_3OO^- + BR\cdot^-$	3.2×10^9	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CBr_4 and bilirubin.	89A901
7.47.4	**Chlorpromazine, conjugate acid**						
	$CBr_3OO\cdot + CZH^+ \rightarrow CZ\cdot^+ + CBr_3OO^-$	5.7×10^7		2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 2% CBr_4.	87A173
		7.7×10^8	5.4	Water/ 2-PrOH	p.r.	P.b.k. at 525 nm in air-satd. soln. contg. 40% 2-PrOH and CBr_4.	87A480
7.47.5	**Hydroquinone**						
	$CBr_3OO\cdot + 1,4\text{-}C_6H_4(OH)_2 \rightarrow CBr_3OO^- + 4\text{-}{}^-OC_6H_4O\cdot + H^+$	1.8×10^7	7	Water/ 2-PrOH	p.r.	P.b.k. at 430 nm in air-satd. soln. contg. 40% 2-PrOH and CBr_4.	87A480
7.47.6	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion**						
	$CBr_3OO\cdot + TxOH^- \rightarrow CBr_3OO^- + HTxO\cdot$	2.6×10^8	~4	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 50% 2-PrOH and 1% CBr_4.	89A384
		7.1×10^8 4.6×10^8	~4	Water/ MeOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 25% and 50% MeOH, respectively, and 1% CBr_4.	89A384
		1.4×10^8	~4	MeOH/ Water	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 75% MeOH and 1% CBr_4.	89A384
		3.7×10^7			p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 1% CBr_4.	89A384

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.47	**Tribromomethylperoxyl**—Continued						
7.47.7	**Linolenic acid**						
	$CBr_3OO\cdot$ + $CH_3(CH_2CH{=}CH)_3(CH_2)_7CO_2H$ →	1.2×10^6	1	Water/ 2-PrOH	p.r.	C.k.; obs. 700 nm buildup for $[DPFe^{III}]\cdot^+$ in water contg. 50% 2-PrOH, 1×10^{-4} mol L^{-1} iron(III) porphyrin, and 0-0.04 mol L^{-1} linolenic acid, 0.01 mol L^{-1} CBr_4 and 0.1 mol L^{-1} $HClO_4$; rel. to $k(CBr_3OO\cdot$ + $DPDMEFe^{III}) = 2.8 \times 10^8$.	87A232
7.47.8	**4-Methoxyphenol**						
	$CBr_3OO\cdot$ + 4-$CH_3OC_6H_4OH$ → CBr_3OO^- + H^+ + 4-$CH_3OC_6H_4O\cdot$	9.5×10^6	7	Water/ 2-PrOH	p.r.	P.b.k. at 420 nm in air-satd. soln. contg. 40% 2-PrOH and CBr_4.	87A480
7.47.9	**Urate ion**						
	$CBr_3OO\cdot$ + UrO^- → CBr_3OO^- + $UrO\cdot$	4.1×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 40% 2-PrOH and CBr_4.	87A480
		2.5×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 50% 2-PrOH, 0.1 mol L^{-1} KOH and 1% CBr_4.	89A384
		1.8×10^8	13	2-PrOH/ Water	p.r.	P.b.k. at 360 nm in air-satd. soln. contg. 70% 2-PrOH, 0.1 mol L^{-1} KOH and 1% CBr_4.	89A384
7.47.10	**Xanthine, negative ion**						
	$CBr_3OO\cdot$ + XO^- → CBr_3OO^- + $XO\cdot$	1.7×10^8	13	Water/ 2-PrOH	p.r.	P.b.k. at 350 nm in air-satd. soln. contg. 40% 2-PrOH and CBr_4.	87A480
7.48	**Iodomethylperoxyl**						
7.48.1	**Ascorbate ion**						
	$CH_2IOO\cdot$ + AH^- → CH_2IOOH + $\cdot A^-$	1.3×10^8	8	Water	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 5% 2-PrOH and 0.02% CH_2I_2.	89A165
		6.3×10^7	8	Water/ 2-PrOH	p.r.	P.b.k at 360 nm in air-satd. soln. contg. 40% 2-PrOH and 0.06% CH_2I_2.	89A165
7.48.2	**Bilirubin dianion**						
	$CH_2IOO\cdot$ + BR^{2-} → CH_2IOO^- + $BR\cdot^-$	1.9×10^8	11	Water/ *tert*-BuOH	p.r.	P.b.k. at 590 nm in aerated soln. contg. 2.0 mol L^{-1} *tert*-BuOH, CH_2I_2 and bilirubin.	89A901
7.49	**Peroxyl radicals from linoleate**						
7.49.1	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	$LOO\cdot$ + $DPDMEFe^{III}(HOCH(CH_3)_2)_2$ → LOO^- + $[DPDMEFe^{III}(HOCH(CH_3)_2)_2]\cdot^+$	3.5×10^7	1	Water/ 2-PrOH	p.r.	P.b.k. at 655 nm in air-satd. soln. contg. 50% 2-PrOH, 2-3% CCl_4, 0.1 mol L^{-1} $HClO_4$, 0.01 mol L^{-1} linoleic acid, and 0.5-1 $\times 10^{-4}$ mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; mixture of 13-peroxyl with other isomers.	85A341
7.49.2	**Linoleic acid**						
	$LOO\cdot$ + LH → $L\cdot$ + $LOOH$	3.6×10^1	acid	EtOH/ Water	s.f.	P.b.k. at 250 (LOOH) nm in 70% ethanol contg. oxygen and linoleic acid; mixture of 13-peroxyl with other isomers.	81A288

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.50	**13-Peroxyl radical from linoleate**						
7.50.1	**8,5,7-Trihydroxy-2-(4-hydroxyphenyl)-2-benzopyran-4-one**						
	LOO· + KfOH → LOOH + KfO·	4.2×10^7	11.5	Water	p.r.	P.b.k. in N_2O-satd. soln. contg. azide and 13-hydroperoxylinoleate ion; $k = 3.4 \times 10^7$ for mixture of peroxyl radicals formed in N_2O-O_2 satd. linoleate soln.	87A277
7.50.2	**Quercetin**						
	LOO· + QOH → LOOH + QO·	1.5×10^7	11.5	Water	p.r.	P.b.k. in N_2O-satd. soln. contg. azide and 13-hydroperoxylinoleate ion; $k = 1.8 \times 10^7$ in N_2O-O_2 satd. linoleate soln.	87A277
7.51	**Peroxyl radicals from oleic acid**						
7.51.1	**Iron(III) deuteroporphyrin, dimethyl ester, (2-propanol)$_2$**						
	LOO· + DPDMEFe^{III}(HOCH(CH$_3$)$_2$)$_2$ → LOO$^-$ + [DPDMEFe^{III}(HOCH(CH$_3$)$_2$)$_2$]·$^+$	3.5×10^7	1	Water/ 2-PrOH	p.r.	P.b.k. at 655 nm in air-satd. soln. contg. 50% 2-PrOH, oleic acid, 0.1 mol L^{-1} $HClO_4$, and 0.5-1 × 10^{-4} mol L^{-1} Fe^{III} deuteroporphyrin dimethyl ester; same value for linolenic acid.	85A341
7.51.2	**α-Tocopherol**						
	LOO· + ArOH → LOOH + ArO·	2.5×10^6		Oleic acid	p.r.	P.b.k. in oxygen-satd. soln.; mixture of radicals from solvent.	79G405
7.52	**6-Peroxyl radical of uracil-5-OH adduct**						
7.52.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	U(OH)OO· + TMPD → TMPD·$^+$ + U(OH)OO$^-$	1.4×10^8	6-11	Water	p.r.	P.b.k. in N_2O/O_2 (4:1) satd. soln.; slow component.	81A122
7.53	**6-Peroxyl radical of cytosine-5-OH adduct**						
7.53.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	Cy(OH)OO· + TMPD → TMPD·$^+$ + Cy(OH)OO$^-$	1.6×10^8	7-8	Water	p.r.	P.b.k. in N_2O/O_2 (4:1) satd. soln.; slow component.	83A132
7.54	**6-Peroxyl radical of thymine-5-OH adduct**						
7.54.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	5-MeU(OH)OO· + TMPD → TMPD·$^+$ + 5-MeU(OH)OO$^-$	~1×10^8	~7	Water	p.r.	P.b.k. in N_2O/O_2 (4:1) satd. soln.; slow component.	81A122
7.55	**Peroxyl radicals of thymine-OH adduct**						
7.55.1	**Norpseudopelletierine *N*-oxyl**						
	5-MeU(OH)OO· + NPPN →	8.0×10^8	7	Water	p.r.	P.b.k. at 300 nm in oxygen-satd. soln. contg. 5×10^{-4} mol L^{-1} thymine.	80A124
7.55.2	**2,2,6,6-Tetramethylpiperidine-*N*-oxyl**						
	5-MeU(OH)OO· + TMPN →	3.1×10^7	7	Water	p.r.	P.b.k. at 300 nm in oxygen-satd. soln. contg. 5×10^{-4} mol L^{-1} thymine.	80A124
7.56	**Peroxyl radical of thymidine-OH adduct**						
7.56.1	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	T(OH)OO· + ABTS → ABTS·$^+$ + T(OH)OO$^-$	1.3×10^7	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.2×10^{-3} mol L^{-1} thymidine and 2×10^{-3} mol L^{-1} phosphate.	85A503

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.56	**Peroxyl radical of thymidine-OH adduct**—Continued						
7.56.2	**Ascorbate ion**						
	T(OH)OO· + AH^- → ·A^- + T(OH)OOH	2.5×10^7	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.2×10^{-3} mol L^{-1} thymidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.56.3	**Hydroquinone**						
	T(OH)OO· + 1,4-$C_6H_4(OH)_2$ →	6.5×10^6	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.2×10^{-3} mol L^{-1} thymidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.56.4	**4-Methoxyphenol**						
	T(OH)OO· + 4-$CH_3OC_6H_4OH$ →	$<1 \times 10^6$	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.2×10^{-3} mol L^{-1} thymidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.56.5	**Norpseudopelletierine *N*-oxyl**						
	T(OH)OO· + NPPN →	1.3×10^9	7	Water	p.r.	P.b.k. at 300 nm in oxygen-satd. soln. contg. 5×10^{-4} mol L^{-1} thymidine.	80A124
7.56.6	**2,2,6,6-Tetramethylpiperidine-*N*-oxyl**						
	T(OH)OO· + TMPN →	2.0×10^8	7	Water	p.r.	P.b.k. at 300 nm in oxygen-satd. soln. contg. 5×10^{-4} mol L^{-1} thymidine.	80A124
7.56.7	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	T(OH)OO· + TMPD → $TMPD^{\cdot+}$ + $T(OH)OO^-$	8.3×10^7	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.2×10^{-3} mol L^{-1} thymidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.57	**Peroxyl radical of deoxyguanosine-OH adduct**						
7.57.1	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	dG(OH)OO· + TMPD → $TMPD^{\cdot+}$ + $dG(OH)OO^-$	1.5×10^9	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 10^{-3} mol L^{-1} deoxyguanosine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.58	**Peroxyl radical of deoxycytidine-OH adduct**						
7.58.1	**Ascorbate ion**						
	dC(OH)OO· + AH^- → ·A^- + dC(OH)OOH	1.8×10^7	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.0×10^{-3} mol L^{-1} deoxycytidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.58.2	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**						
	dC(OH)OO· + ABTS → $ABTS^{\cdot+}$ + $dC(OH)OO^-$	1.2×10^7	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.0×10^{-3} mol L^{-1} deoxycytidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.58.3	**Hydroquinone**						
	dC(OH)OO· + 1,4-$C_6H_4(OH)_2$ →	1.1×10^7	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.0×10^{-3} mol L^{-1} deoxycytidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.58.4	**4-Methoxyphenol**						
	dC(OH)OO· + 4-$CH_3OC_6H_4OH$ →	$<1 \times 10^6$	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.0×10^{-3} mol L^{-1} deoxycytidine and 2×10^{-3} mol L^{-1} phosphate.	85A503

TABLE 7. Rate constants for reactions of substituted alkylperoxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.58	**Peroxyl radical of deoxycytidine-OH adduct**—Continued						
7.58.5	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**						
	$dC(OH)OO\cdot$ + TMPD → $TMPD\cdot^+$ + $dC(OH)OO^-$	6.8×10^7	7	Water	p.r.	P.b.k.; oxygen-satd. soln. contg. 2.0×10^{-3} mol L^{-1} deoxycytidine and 2×10^{-3} mol L^{-1} phosphate.	85A503
7.59	**Peroxyl radical of polyuridylic acid-OH adduct**						
7.59.1	**Cysteamine**						
	Poly $U(OH)OO\cdot$ + $H_3N^+CH_2CH_2S^-$ →	1.7×10^4	6.3	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} poly U, and 3×10^{-5} mol L^{-1} cysteamine.	86A213
7.59.2	**Dithiothreitol**						
	Poly $U(OH)OO\cdot$ + DTT →	5×10^4	6.3	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} poly U, and 3×10^{-5} mol L^{-1} DTT.	86A213
7.59.3	**Glutathione**						
	Poly $U(OH)OO\cdot$ + GSH →	8×10^3	6.3	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} poly U, and 3×10^{-5} mol L^{-1} GSH.	86A213
7.60	**Peroxyl radical of polyadenylic acid-OH adduct**						
7.60.1	**Cysteamine**						
	Poly $A(OH)OO\cdot$ + $H_3N^+CH_2CH_2S^-$ →	1×10^5	7.4	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} poly A, and 3×10^{-5} mol L^{-1} cysteamine.	86A213
7.60.2	**Dithiothreitol**						
	Poly $A(OH)OO\cdot$ + DTT →	1.3×10^5	7.4	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} poly A, and 3×10^{-5} mol L^{-1} DTT.	86A213
7.60.3	**Glutathione**						
	Poly $A(OH)OO\cdot$ + GSH →	5×10^4	7.4	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} poly A, and 3×10^{-5} mol L^{-1} GSH.	86A213
7.61	**Peroxyl radical of single-stranded DNA-OH adduct**						
7.61.1	**Dithiothreitol**						
	ssDNA$(OH)OO\cdot$ + DTT →	4×10^4 3×10^4	7.2	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} ssDNA, and 3×10^{-5} mol L^{-1} DTT.	86A213
7.61.2	**Cysteamine**						
	ssDNA$(OH)OO\cdot$ + $H_3N^+CH_2CH_2S^-$ →	2×10^4 5×10^4	7.2	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} ssDNA, and 3×10^{-5} mol L^{-1} cysteamine.	86A213
7.61.3	**Glutathione**						
	ssDNA$(OH)OO\cdot$ + GSH →	1.5×10^4	7.2	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} ssDNA, and 3×10^{-5} mol L^{-1} GSH.	86A213

TABLE 7. Rate constants for reactions of substituted alkyl- and oxyl radicals with inorganic and organic substrates—Continued

No.	Radical/Reactant	k (L mol^{-1} s^{-1})	pH	Solvent	Method	Comment	Ref.
7.62	**Peroxyl radical of double-stranded DNA-OH adduct**						
7.62.1	**Dithiothreitol**						
	dsDNA(OH)OO· + DTT →	4×10^4 6×10^4	7.5	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} dsDNA, and 3×10^{-5} mol L^{-1} DTT.	86A213
7.62.2	**Cysteamine**						
	dsDNA(OH)OO· + $H_3N^+CH_2CH_2S^-$ →	5×10^4 8×10^4	7.5	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} dsDNA, and 3×10^{-5} mol L^{-1} cysteamine.	86A213
7.62.3	**Glutathione**						
	dsDNA(OH)OO· + GSH →	2×10^4 4.5×10^4	7.5	Water	phot.	D.k. (esr) in oxygen-satd. soln. contg. 10^{-3} mol L^{-1} H_2O_2, 10^{-3} mol L^{-1} dsDNA, and 3×10^{-5} mol L^{-1} GSH.	86A213
7.62.4	**2,2,6,6-Tetramethylpiperidine-*N*-oxyl**						
	dsDNA(OH)OO· + TMPN →	9×10^6	7	Water	p.r.	D.k. at 320 nm in oxygen-satd. soln.; $k = 5.4 \times 10^7$ for denatured DNA.	80A124

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8.1. Molecular Formula Index

$C_3H_8O_6P$ Dimethylphosphatomethylperoxyl *5.62, 62.1*

$C_3H_9O_3P$ Trimethyl phosphite *6.5.72*

$C_4H_3N_2O_3^-$ Isobarbiturate ion *6.1.10, 7.18.3, 7.42.50*

$C_4H_3N_2O_4^-$ 3,6-Dioxopiperazinylperoxyl, conjugate base *4.16*

$C_4H_4NO_4^{2-}$ Carboxy(carboxymethylamino)methyl, dianion *3.34*

$C_4H_5N_2O_2$ 3,6-Dioxo-2-piperazinyl *3.54*

$C_4H_5N_2O_3$ Uracil-OH adduct *3.59*

$C_4H_5N_2O_4$ 3,6-Dioxo-2-piperazinylperoxyl *5.73, 73.1*
Peroxyl radical of uracil-H adduct *4.18, 5.75, 75.1*

$C_4H_5N_2O_5$ 6-Peroxyl radical of uracil-5-OH adduct *7.52*
Peroxyl radical of uracil-OH adduct *5.76, 76.1*

$C_4H_6N_3O_2$ Cytosine-OH adduct *3.60*

$C_4H_6N_3O_4$ 6-Peroxyl radical of cytosine-5-OH adduct *7.53*

$C_4H_6O_4$ 1-Acetoxyethylperoxyl *5.47, 47.1*

$C_4H_7O_3$ Tetrahydro-2-furanylperoxyl *7.10*

$C_4H_7O_4$ 2,5-Dioxacyclohexylperoxyl *7.11*

$C_4H_8O_2S$ 3-(Methylthio)propionic acid *7.42.65*

C_4H_9 *tert*-Butyl *3.3*

C_4H_9N Pyrrolidine *6.5.53*

C_4H_9O 1-Hydroxy-1-methylpropyl *3.17*
1-Hydroxy-2-methylpropyl *3.18*

$C_4H_9O_2$ Butylperoxyl *6.4*
sec-Butylperoxyl *5.2, 2.1*
tert-Butylperoxyl *5.3, 3.1, 6.5*

$C_4H_9O_3$ 1-Ethoxyethylperoxyl *5.41, 41.1, 7.9*
2-Hydroxy-2,2-dimethylethylperoxyl *5.32, 32.1, 7.8*

$C_4H_9O_4$ 1,1-Dimethoxyethylperoxyl *4.14*

$C_4H_9O_6$ 1,2,3,4-Tetrahydroxybutylperoxyl *4.7*

$C_4H_{10}OS$ Ethyl 2-hydroxyethyl sulfide *7.42.39*

$C_4H_{10}O_2$ *sec*-Butyl hydroperoxide *6.5.13*

$C_4H_{10}O_2S_2$ Dithiothreitol *7.59.2, 7.60.2, 7.61.1, 7.62.1*

$C_4H_{11}NO_2^+$ Trimethylammoniomethylperoxyl *7.21*

$C_5H_3N_4O_2^-$ Xanthine, negative ion *6.1.15, 7.24.10, 7.42.85, 7.47.10*

$C_5H_3N_4O_3^-$ Urate ion *6.1.14, 7.24.9, 7.42.84, 7.47.9*

C_5H_5N Pyridine *7.42.74*

$C_5H_5N_2O_2$ Thymine radical *3.58*

$C_5H_6N_2O_2$ 1-Methyluracil *7.42.66*

$C_5H_6N_2O_2^-$ Thymine radical anion *3.57*

$C_5H_7N_2O_3$ Thymine-OH adduct *3.61*

$C_5H_7N_2O_4$ Peroxyl radical of thymine-H adduct *5.74, 74.1*

$C_5H_7N_2O_5$ 6-Peroxyl radical of thymine-5-OH adduct *7.54*
Peroxyl radicals of thymine-OH adduct *7.55*

$C_5H_7O_2$ Peroxyl radical from cyclopentene *5.6, 6.1*

$C_5H_8N_2O$ 3,4-Dimethyl-2-pyrazolin-5-one *7.42.36*

$C_5H_8O_4$ 1-Acetoxy-1-methylethylperoxyl *5.49, 49.1*
1-Acetoxypropylperoxyl *5.48, 48.1*

C_5H_9 Cyclopentyl *3.4*

$C_5H_9O_2$ Cyclopentylperoxyl *5.7, 7.1, 6.7*

$C_5H_9O_3$ Hydroxycyclopentylperoxyl *5.33, 33.1*
Pivaloylperoxyl *7.17*

$C_5H_9O_4$ 1,3-Dihydroxycyclopentylperoxyl *5.37, 37.1*
Radicals from deoxyribose *3.23*

$C_5H_{10}IS$ 1-Ethylthio-3-iodopropane *7.42.40*

$C_5H_{10}O_2S$ Methyl 3-(methylthio)propionate *7.42.62*

$C_5H_{11}N$ Piperidine *6.5.51*

$C_5H_{11}NO_2S$ Methionine *7.32.12, 7.42.53*

$C_5H_{11}O_2$ 1,1-Dimethylpropylperoxyl *6.6*
2,2-Dimethylpropylperoxyl *5.5, 5.1*
Pentylperoxyl *5.4, 4.1*

$C_5H_{11}O_6$ Tri(methoxy)methoxymethylperoxyl *7.14*

$C_5H_{11}O_7$ 1,2,3,4,5-Pentahydroxypentylperoxyl *4.8*

$C_6H_5O^-$ Phenoxide ion *6.1.11, 7.23.1, 7.27.11, 7.30.2, 7.35.12, 7.39.3, 7.42.70*

$C_6H_6CoNO_6^-$ Nitrilotriacetatocobaltate(II) ion *6.1.2, 7.8.1*

$C_6H_6MnNO_6^-$ Nitrilotriacetatomanganate(II) ion *7.8.3*

C_6H_6O Phenol *6.5.48, 7.24.8, 7.42.69*

$C_6H_6O_2$ Hydroquinone *6.1.7, 7.24.4, 7.42.44, 7.47.5, 7.56.3, 7.58.3*

C_6H_6S Thiophenol *6.5.58*

C_6H_7 Cyclohexadienyl *3.6*

C_6H_7N Aniline *6.5.12, 7.27.4, 7.35.4*

C_6H_7O 2-Hydroxycyclohexadienyl *3.7*

$C_6H_7O_3$ Hydroxycyclohexadienylperoxyl *5.35, 35.1*

$C_6H_7O_6^-$ Ascorbate ion *6.1.3, 7.1.1, 7.2.1, 7.3.1, 7.4.1, 7.5.4, 7.7.4, 7.8.6, 7.15.1, 7.16.1, 7.18.2, 7.20.1, 7.21.1, 7.22.1, 7.24.2, 7.25.1, 7.26.1, 7.27.5, 7.28.1, 7.29.1, 7.30.1, 7.32.4, 7.34.1, 7.35.5, 7.36.1, 7.37.1, 7.38.1, 7.39.1, 7.41.1, 7.42.17, 7.44.1, 7.45.1, 7.47.2, 7.48.1, 7.56.2, 7.58.1*

$C_6H_8N_2O_4^-$ 2,5-Dimethyl-3,6-dioxopiperazinylperoxyl, conjugate base *4.17*

$C_6H_8O_6$ Ascorbic acid *6.1.4, 7.42.18*

$C_6H_9N_2O_2$ 1,4-Dimethyl-3,6-dioxo-2-piperazinyl *3.56*
2,5-Dimethyl-3,6-dioxo-2-piperazinyl *3.55*

$C_{33}H_{27}O_{10}$ 1,1,1-Tribenzoatomethyl-2-benzoatoethylperoxyl *5.61, 61.1*

$C_{33}H_{34}N_4O_6^{2-}$ Bilirubin dianion *6.1.6, 6.2.1, 7.27.7, 7.29.2, 7.31.1, 7.33.1, 7.35.7, 7.36.3, 7.37.3, 7.42.20, 7.43.1, 7.45.2, 7.46.1, 7.47.3, 7.48.2*

$C_{36}H_{30}Pb_2$ Hexaphenyldilead *6.5.5*

$C_{36}H_{30}Sn_2$ Hexaphenylditin *6.5.6*

$C_{36}H_{43}FeN_4O_4$ Iron(III) deuteroporphyrin IX (2-propoxy)(2-propanol) *7.32.2, 7.42.4*

$C_{38}H_{44}N_5ORu^+$ 2,3,7,8,12,13,17,18-Octaethylporphinato(carbonyl)cyanoruthenium(II) ion *7.42.6*

$C_{38}H_{50}FeN_4O_4$ Iron(III) deuteroporphyrin, dimethyl ester, $(2\text{-propanol})_2$ *7.7.3, 7.27.1, 7.32.1, 7.35.1, 7.42.3, 7.47.1, 7.49.1, 7.51.1*

$C_{39}H_{67}O_4$ 3β-3-Dodecanoyloxycholest-5-en-7-ylperoxyl *5.71, 71.1*

$C_{39}H_{69}O_4$ 3β-3-Dodecanoyloxycholestan-7-ylperoxyl *5.72, 72.1*

$C_{40}H_{24}N_8Zn$ 5,10,15,20-Tetrakis(4-pyridyl)porphinatozinc(II) *7.42.10*

$C_{40}H_{56}$ β-Carotene *7.42.22*

$C_{44}H_{24}N_4O_{12}S_4Zn^{4-}$ 5,10,15,20-Tetrakis(4-sulfonatophenyl)porphinatozincate(II) ion *7.42.15*

$C_{44}H_{28}GaN_4^+$ 5,10,15,20-Tetraphenylporphinatogallium(III) ion *7.42.5*

$C_{44}H_{28}N_4O_4Zn$ 5,10,15,20-Tetrakis(2-hydroxyphenyl)porphinatozinc(II) *7.42.12*

5,10,15,20-Tetrakis(3-hydroxyphenyl)porphinatozinc(II) *7.42.13*

5,10,15,20-Tetrakis(4-hydroxyphenyl)porphinatozinc(II) *7.42.14*

$C_{44}H_{28}N_4Zn$ 5,10,15,20-Tetraphenylporphinatozinc(II) *7.42.8*

$C_{44}H_{36}N_8Zn^{4+}$ 5,10,15,20-Tetrakis(1-methylpyridinium-4-yl)porphinatozinc(II) ion *7.42.11*

$C_{48}H_{36}N_4Zn$ 5,10,15,20-Tetrakis(4-methylphenyl)porphinatozinc(II) *7.27.2, 7.35.2*

$C_{49}H_{33}N_5Zn$ 5,10,15,20-Tetraphenylporphinatozinc(II) pyridine complex *7.42.9*

$C_{53}H_{41}N_5Zn$ 5,10,15,20-Tetrakis(4-methylphenyl)porphinatozinc(II) pyridine complex *7.27.3, 7.35.3*

ClO_2^- Chlorite ion *7.42.1*

Cl_3P Phosphorus trichloride *6.5.4*

Cl_5Pt^{2-} Pentachloroplatinate(III) ion *7.5.3*

Cu^+ Copper(I) ion *7.6.1, 7.7.1*

Cu^{2+} Copper(II) ion *7.6.2*

Fe^{2+} Iron(II) ion *7.7.2*

HO^- Hydroxide ion *4.1.3, 4.2.2, 4.3.3*

HO_4P^{2-} Hydrogen phosphate ion *4.1.2, 4.2.3, 4.3.2*

$H_{15}N_6ORu^{2+}$ Pentaamminenitrosylruthenium(III) ion, electron adduct *7.8.5*

O_3S^{2-} Sulfite ion *7.18.1, 7.42.7*

8.2 Chemical Name Index