ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 51

[ ]

Air Quality: Revision to Definition of Volatile Organic Compounds - Exclusion of 16 Compounds

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: This action proposes to revise EPA's definition of volatile organic compounds (VOC) for purposes of preparing State implementation plans (SIP's) to attain the national ambient air quality standards (NAAQS) for ozone under title I of the Clean Air Act (Act) and for any Federal implementation plan (FIP) for an ozone nonattainment area. This proposed revision would add 16 compounds (shown in Table 3) to the list of compounds excluded from the definition of VOC on the basis that these compounds have negligible contribution to tropospheric ozone formation. These compounds have potential for use as refrigerants, aerosol propellants, fire extinguishes, blowing agents and solvents. Several of these compounds may be used as alternatives to chlorofluorocarbons (CFC's) which are being phased out of production as stratospheric ozone depleters.

DATES: Comments on this proposal must be received by [insert date 30 days after publication in the Federal Register]. Requests for a hearing must be submitted by [insert date 30 days after publication in the Federal Register].

ADDRESSES: Comments should be submitted in duplicate (if

possible) to: Air and Radiation Docket and Information Center (6102), Attention: Docket No. A-96-36, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460. Comments should be strictly limited to the subject matter of this proposal, the scope of which is discussed below.

Public Hearing: If anyone contacts EPA requesting a public hearing, it will be held at Research Triangle Park, NC. Persons wishing to request a public hearing/wanting to attend the hearing or wishing to present oral testimony should notify Mr. William Johnson, Air Quality Management Division (MD-15), U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, telephone (919) 541-5245. The EPA will publish notice of a hearing, if requested, in the Federal Register. Any hearing will be strictly limited to the subject matter of the proposal, the scope of which is discussed below. The EPA has established a public docket for this action, A-96-36, which is available for public inspection and copying between 8 a.m. and 4 p.m., Monday through Friday, at EPA's Air and Radiation Docket and Information Center, (6102), 401 M Street, SW, Washington, DC 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: William Johnson, Office of Air Quality Planning and Standards, Air Quality Management Division (MD-15), Research Triangle Park, NC 27711, phone (919) 541-5245. Interested persons may call Mr. Johnson to

see if a hearing will be held and the date and location of any hearing.

SUPPLEMENTARY INFORMATION:

Regulated entities. Entities potentially regulated by this action are those which use and emit VOC and States which have programs to control VOC emissions.

Category	Examples of regulated entities
Industry	Industries that use refrigerants, blowing agents, or solvents
States	States which have regulations to control volatile organic compounds

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your organization is regulated by this action, you should carefully examine the applicability criteria in § 51.100 of title 40 of the Code of Federal Regulations. If you have questions regarding the applicability of this

action to a particular entity, consult the person listed in the preceding "FOR FURTHER INFORMATION CONTACT" section.

I. **Background**

On September 25, 1995 the Alliance for Responsible Atmospheric Policy submitted to the EPA a petition which requested that the compounds shown in Table 1 be added to the list of compounds which are considered to be negligibly reactive in the definition of VOC at 40 CFR 51.100(s). (The original petition also included five other compounds (CFC-111, CFC-112, CFC-112A, CFC-113a, and CFC-114a) not shown in Table 1, but the petitioner later requested that these compounds be removed from consideration.)

Potential uses for these compounds are also shown in Table 1. Blowing agent refers to products used in the manufacture of foamed plastic. The compounds for which no use is shown have no currently recognized commercial end-use. They may be either intermediates or unintentional byproducts resulting from the manufacture of other compounds. The petition points out that the use of HCFC and HFC compounds can be substituted for CFC's and can thereby reduce potential chlorine effects on stratospheric ozone.

Table 1

Compounds Petitioned for VOC Exclusion

(along with potential uses of compounds)

Compound	Potential Use
HFC-32	refrigerant
HFC-161	aerosol propellant, blowing agent
HFC-236fa	fire extinguishant, refrigerant
HFC-245ca	refrigerant, blowing agent
HFC-245eb	refrigerant, blowing agent
HFC 245fa	refrigerant, blowing agent
HFC 245ea	solvent
HFC-236ea	refrigerant, blowing agent
HFC-365mfc	blowing agent
HCFC-31	
HCFC-150a	
HCFC-151a	
HCFC-123a	blowing agent
$C_4F_9OCH_3$	solvent
$(CF_3)_2CFCF_2OCH_3$	solvent
$C_4F_9OC_2H_5$	solvent
$(CF_3)_2CFCF_2OC_2H_5$	solvent

In support of the petitions, the Alliance for Responsible Atmospheric Policy supplied information on the photochemical reactivity of the individual compounds. This information consisted mainly of the rate constant for the

reaction of the compound with the hydroxyl (OH) radical. This rate constant (k_{OH} value) is commonly used as one measure of the photochemical reactivity of compounds. The petitioner compared the rate constants with that of ethane which has already been listed as photochemically negligibly reactive (ethane is the compound with the highest k_{OH} value which is currently regarded as negligibly reactive). The compounds under consideration are listed in Table 2 along with their reported k_{OH} rate constants. The scientific information which the petitioner has submitted in support of the petition has been added to the docket for this rulemaking. This information includes references for the journal articles where the rate constant values are published.

Table 2

Reaction Rate Constants with OH Radical

Reported Rate Constant at 25°C

Compound	cm^3/molecule/sec	CAS number
ethane	2.4×10^{-13}	
HFC-32	1.0×10^{-14}	75-10-5
HFC-161	17×10^{-14}	353-36-6
HFC-236fa	0.034×10^{-14}	690-39-2
HFC-245ca	0.91×10^{-14}	679-86-7
HFC-245ea	1.6×10^{-14}	
HFC-245eb	1.5×10^{-14}	431-31-2

HFC-245fa	0.66×10^{-14}	690-39-1
HFC-236ea	0.66×10^{-14}	431-63-0
HFC-365mfc	0.87×10^{-14}	406-58-6
HCFC-31	4.5×10^{-14}	593-70-4
HCFC-123a	1.23×10^{-14}	354-23-4
HCFC-150a	2.6×10^{-13}	75-34-3
HCFC-151a	6.9×10^{-14}	1615-75-4
$C_4F_9OCH_3$	1.4×10^{-14}	163702-07-6
$(CF_3)_2CFCF_2OCH_3$	1.4×10^{-14}	163702-08-7
$C_4F_9OC_2H_5$	6.4×10^{-14}	163702-05-4
$(CF_3)_2CFCF_2OC_2H_5$	6.4×10^{-14}	163702-06-5

II. The EPA Response to the Petitions

For the petition submitted by the Alliance for Responsible Atmospheric Policy, the existing data support that the reactivities of the compounds submitted (except for HCFC-150a), with respect to reaction with OH radicals in the atmosphere, are lower than that of ethane.

In the petition, the petitioner did not submit reactivity data with respect to other VOC loss reactions (such as reaction with O-atoms, nitrogen trioxide (NO_3)-radicals, and ozone (O_3), and for photolysis). However, there is ample evidence in the literature that halogenated paraffinic VOC, such as the compounds listed above, do not participate in such reactions significantly.

The information submitted by the petitioner for HCFC-150a does not justify the petitioners request that this compound be declared "negligibly reactive." The reactivity of HCFC-150a with respect to reaction with OH is higher than that of ethane (i.e., 26 x 10^{-14} cm^3 $molecule^{-1}$ s^{-1} vs. 24 x 10^{-14} cm^3 $molecule^{-1}$ s^{-1}, for reaction rate constants). This suggests, but in the absence of detailed information on the atmospheric chemistry of HCFC-150a does not prove, a higher ozone-forming reactivity. In the cases of such VOC species, for which conclusive scientific evidence is not available, the EPA policy has been to assume the VOC species to have significant ozone-forming reactivity unless and until additional specific evidence is produced that attests the contrary position. At this time, therefore, a "negligibly reactive" rating for HCFC-150a cannot be justified.

The EPA is responding to the petition by proposing in this notice to add the compounds in Table 3 to the list of compounds appearing in 40 CFR 51.100(s).

Table 3

Compounds Proposed to be Added to the List of Negligibly Reactive Compounds

Compound	Chemical Name or Formula
HFC-32	difluoromethane
HFC-161	ethylfluoride

HFC-236fa	1,1,1,3,3,3-hexafluoropropane
HFC-245ca	1,1,2,2,3-pentafluoropentane
HFC-245ea	1,1,2,3,3-pentafluoropropane
HFC-245eb	1,1,1,3,4-pentafluoropentane
HFC-245fa	1,1,1,3,3-pentafluoropentane
HFC-236ea	1,1,1,2,3,3-hexafluoropropane
HFC-365mfc	1,1,1,3,3-pentafluorobutane
HCFC-31	chlorofluoromethane
HCFC-123a	1,2-dichloro-1,1,2-trifluoroethane
HCFC-151a	1 chloro-1-fluoroethane
$C_4F_9OCH_3$	1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane
$(CF_3)_2CFCF_2OCH_3$	2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane
$C_4F_9OC_2H_5$	1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane
$(CF_3)_2CFCF_2OC_2H_5$	2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane

III. Proposed Action

Today's proposed action is based on EPA's review of the material in Docket No. A-96-36. The EPA hereby proposes to amend its definition of VOC at 40 CFR 51.100(s) to exclude the compounds in Table 3 as VOC for ozone SIP and ozone control purposes. The revised definition will also apply in the Federal implementation plans in ozone nonattainment

areas pursuant to the 40 CFR 52.741(a)(3) definition of volatile organic material or VOC. States are not obligated to exclude from control as a VOC those compounds that EPA has found to be negligibly reactive. However, if this action is made final, States should not include these compounds in their VOC emissions inventories for determining reasonable further progress under the Act (e.g., section 182(b)(1)) and may not take credit for controlling these compounds in their ozone control strategy.

IV. Administrative Requirements

A. Docket

The docket is an organized and complete file for all information submitted or otherwise considered by EPA in the development of this proposed rulemaking. The principle purposes of the docket are: (1) To allow interested parties to identify and locate documents so that they can effectively participate in the rulemaking process; and, (2) to serve as the record in case of judicial review (except for interagency review materials) (section 307(d)(7)(A)).

B. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether a regulatory action is "significant" and therefore subject to Office of Management and Budget (OMB) review and the requirements of this Executive Order. The Order defines "significant

regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligation of recipients thereof; or

(4) raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is not "significant" because none of the listed criteria apply to this action. Consequently, this action was not submitted to OMB for review under Executive Order 12866.

C. Unfunded Mandates Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (Unfunded Mandates Act) (signed into law on March 22, 1995) requires that the Agency prepare a budgetary impact statement before promulgating a rule that includes a Federal mandate that may result in expenditure by State, local, and

tribal governments, in aggregate, or by the private sector of $100 million or more in any 1 year. Section 204 requires the Agency to establish a plan for obtaining input from and informing, educating, and advising any small governments that may be significantly or uniquely affected by the rule.

Under section 205 of the Unfunded Mandates Act, the Agency must identify and consider a reasonable number of regulatory alternatives before promulgating a rule for which a budgetary impact statement must be prepared. The Agency must select from those alternatives the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule, unless the Agency explains why this alternative is not selected or the selection of this alternative is inconsistent with law.

Since this proposed rule is deregulatory in nature and does not impose a mandate upon any source, this rule is not estimated to result in the expenditure by State, local and tribal governments or the private sector of $100 million in any 1 year. Therefore, the Agency has not prepared a budgetary impact statement or specifically addressed the selection of the least costly, most cost-effective, or least burdensome alternative. Because small governments will not be significantly or uniquely affected by this rule, the Agency is not required to develop a plan with regard to small governments.

D. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) of 1980 requires the identification of potentially adverse impacts of Federal regulations upon small business entities. The Act specifically requires the completion of an RFA analysis in those instances where the regulation would impose a substantial impact on a significant number of small entities. Because this proposed rulemaking imposes no adverse economic impacts, an analysis has not been conducted. Pursuant to the provision of 5 U.S.C. 605(b), I hereby certify that the proposed rule will not have an impact on small entities because no additional costs will be incurred.

E. Paperwork Reduction Act

This proposed rule does not change any information collection requirements subject to OMB under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

List of Subjects in 40 CFR Part 51

Administrative practice and procedure, Air pollution control, Carbon monoxide, Intergovernmental relations, Lead, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

_____ _____

Date Administrator

Billing Code: 6560-50-P

For reasons set forth in the preamble, part 51 of chapter I of title 40 of the Code of Federal Regulations is proposed to be amended as follows:

Part 51-REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS.

1. The authority citation for part 51 continues to read as follows:

Authority: 42 U.S.C. 7401-7641q

2. Section 51.100 is proposed to be amended by revising paragraph (s)(1) to read as follows:

51.100 Definitions

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(s) "Volatile organic compounds (VOC)" means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.

(1) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity: methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (HCFC-22); trifluoromethane (HFC-23); 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114); chloropentafluoroethane (CFC-

115); 1,1,1-trifluoro 2,2-dichloroethane (HCFC-123); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1-dichloro 1-fluoroethane (HCFC-141b); 1-chloro 1,1-difluoroethane (HCFC-142b); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane (HFC-134); 1,1,1-trifluoroethane (HFC-143a); 1,1-difluoroethane (HFC-152a); parachlorobenzotrifluoride (PCBTF); cyclic, branched, or linear completely methylated siloxanes; acetone; 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee); difluoromethane (HFC-32); ethylfluoride (HFC-161); 1,1,1,3,3,3-hexafluoropropane (HFC-236fa); 1,1,2,2,3-pentafluoropentane (HFC-245ca); 1,1,2,3,3-pentafluoropropane (HFC-245ea); 1,1,1,3,4-pentafluoropentane (HFC-245eb); 1,1,1,3,3-pentafluoropentane (HFC-245fa); 1,1,1,2,3,3-hexafluoropropane (HFC-236ea); 1,1,1,3,3-pentafluorobutane (HFC-365mfc); chlorofluoromethane (HCFC-31); 1 chloro-1-fluoroethane (HCFC-151a); 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a); 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane ($C_4F_9OCH_3$); 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OCH_3$); 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OC_2H_5$); 2-(ethoxydifluoromethyl)-

1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OC_2H_5$); and perfluorocarbon compounds which fall into these classes:

(i) cyclic, branched, or linear, completely fluorinated alkanes;

(ii) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

(iii) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

(iv) sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

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