

## Sodium azide; CASRN 26628-22-8

Human health assessment information on a chemical substance is included in the IRIS database only after a comprehensive review of toxicity data, as outlined in the [IRIS assessment development process](#). Sections I (Health Hazard Assessments for Noncarcinogenic Effects) and II (Carcinogenicity Assessment for Lifetime Exposure) present the conclusions that were reached during the assessment development process. Supporting information and explanations of the methods used to derive the values given in IRIS are provided in the [guidance documents located on the IRIS website](#).

STATUS OF DATA FOR Sodium azide

**File First On-Line 03/31/1987**

Category (section)	Assessment Available?	Last Revised
<b>Oral RfD (I.A.)</b>	yes	03/31/1987
<b>Inhalation RfC (I.B.)</b>	not evaluated	
<b>Carcinogenicity Assessment (II.)</b>	not evaluated	

### I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

#### I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — Sodium azide

CASRN — 26628-22-8

Last Revised — 03/31/1987

The oral Reference Dose (RfD) is based on the assumption that thresholds exist for certain toxic effects such as cellular necrosis. It is expressed in units of mg/kg-day. In general, the RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Please refer to the Background Document for an elaboration of these concepts. RfDs can also be derived for the noncarcinogenic health effects of substances that are also carcinogens. Therefore, it is essential to refer to other sources of

information concerning the carcinogenicity of this substance. If the U.S. EPA has evaluated this substance for potential human carcinogenicity, a summary of that evaluation will be contained in Section II of this file.

### I.A.1. Oral RfD Summary

Critical Effect	Experimental Doses*	UF	MF	RfD
<b>Clinical signs (e.g., hunched postures) and reduced body weight</b>	NOAEL: 5 mg/kg/day converted to 3.57 mg/kg/day	1000	1	4E-3 mg/kg/day
<b>Rat Oral Subchronic Study</b>  <b>NCI, 1981</b>	LOAEL: 10 mg/kg/day converted to 7.14 mg/kg/day			

\*Conversion Factors: x 5 days/7 days

### I.A.2. Principal and Supporting Studies (Oral RfD)

NCI (National Cancer Institute). 1981. Ninety-day subchronic toxicity test with sodium azide in Fischer 344 rats. Study No. 5650.08, report submitted by Microbiological Associates, Bethesda, MD.

NCI (1981) reported a 90-day gavage (distilled water) study with rats (10/sex/group) exposed to 0, 1.25, 2.5, 5, 10 or 20 mg/kg sodium azide, 5 days/week. Nearly total mortality occurred at the 20 mg/kg dose over the experimental period, but no deaths occurred at other doses. A trend in reduced weight gain was seen in the 10 mg/kg group. Females exhibited slightly elevated mean liver-to-body weights in all dosage groups, but the statistical significance of this increase was not reported. Histopathologic evaluations revealed lesions in the brain and lung of the high-dose rats that died; however, no compound-related lesions were discerned in any surviving rats. The only significant clinical signs of toxicity were hunched postures among males in the two highest dosage groups and females in the 20 mg/kg group. Thus, 5 mg/kg was considered a NOAEL. By applying an uncertainty factor of 1000 to this NOAEL and by multiplying by 5 days/7 days to account for continuous exposure, an RfD of 0.004 mg/kg/day or 0.2 mg/day for a 70-kg person is derived.

Data regarding the effects of oral exposure of humans to sodium azide are available, but limited. During investigations of the effects of metabolic inhibition on cancer patients, it was observed that sodium azide lowered the blood pressure of hypertensive but not normotensive individuals (Black et al., 1954). This report further indicated that nine normotensive individuals, including both individuals and cancer patients, experienced no "sustained effect" on blood pressure from the ingestion of as much as 1.3 mg of sodium azide, 3 times/day for 10 days (3.9 mg/day or 0.056 mg/kg/day for a 70-kg man). In a separate study, Black et al. (1954) measured blood pressure 4-12 hours after the last dosage in 30 hypertensive patients treated orally with 0.5-1.3 mg sodium azide, 3 times/day for periods ranging from 7 days to 2.5 years; 25/30 patients sustained lowering of blood pressure towards normotensive levels. Some patients developed an increased sensitivity to the drug with repeated treatment, necessitating a reduction in dosage to 0.25 mg, 3 times/day (0-75 mg/day or 0.011 mg/kg/day). No evidence of damage to the kidney, heart or liver was detected in routine clinical studies of the three hypertensive patients who ingested sodium azide for 1-2.5 years. Despite short duration of exposure (10 days), sodium azide at dosages up to 0.056 mg/kg/day did not produce altered blood pressure in normotensive subjects. The limited information tends to support the rat NOEL of 3.57 mg/kg/day.

### **I.A.3. Uncertainty and Modifying Factors (Oral RfD)**

UF — An uncertainty of 1000 was applied; 10 for interspecies, 10 for intraspecies, and 10 for extrapolating from subchronic to chronic exposure.

MF — None

### **I.A.4. Additional Studies/Comments (Oral RfD)**

Sodium azide is a metabolic inhibitor that interferes with oxidative enzymes and inhibits phosphorylation. A characteristic effect of acute administration of sodium azide to experimental animals is hypotension (Reinhardt and Britelli, 1982). Sodium azide is currently undergoing testing for chronic oral toxicity in rats (NTP, 1985).

### **I.A.5. Confidence in the Oral RfD**

Study — Medium

Database — Medium

RfD — Medium

The critical study is a well-designed subchronic study that defined both the NOEL and LOAEL and was supported by range-finding studies; thus, a medium confidence was assigned. The database contained supportive animal and human subchronic studies, but lacks chronic and

reproductive toxicity studies; thus, the database is rated medium. Medium confidence in the RfD follows.

### **I.A.6. EPA Documentation and Review of the Oral RfD**

Source Document — This assessment is not presented in any existing U.S. EPA document.

Other EPA Documentation — None

Agency Work Group Review — 06/11/1986, 07/22/1986

Verification Date — 07/22/1986

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the RfD for sodium azide conducted in August 2003 did not identify any critical new studies. IRIS users who know of important new studies may provide that information to the IRIS Hotline at [hotline.iris@epa.gov](mailto:hotline.iris@epa.gov) or 202-566-1676.

### **I.A.7. EPA Contacts (Oral RfD)**

Please contact the IRIS Hotline for all questions concerning this assessment or IRIS, in general, at (202)566-1676 (phone), (202)566-1749 (FAX) or [hotline.iris@epa.gov](mailto:hotline.iris@epa.gov) (internet address).

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## **I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)**

Substance Name — Sodium azide

CASRN — 26628-22-8

Not available at this time.

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## **II. Carcinogenicity Assessment for Lifetime Exposure**

Substance Name — Sodium azide

CASRN — 26628-22-8

This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

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**III. [reserved]**

**IV. [reserved]**

**V. [reserved]**

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## **VI. Bibliography**

Substance Name — Sodium azide  
CASRN — 26628-22-8

### **VI.A. Oral RfD References**

Black, M.M., B.W. Zweifach and F.D. Speer. 1954. Comparison of hypotensive action of sodium azide in normotensive and hypertensive patients. *Proc. Soc. Exp. Biol. Med.* 85: 11-16.

NCI (National Cancer Institute). 1981. Ninety-day subchronic toxicity test with sodium azide in Fischer 344 rats. Study No. 5650.08, report submitted by Microbiological Associates, Bethesda, MD.

NTP (National Toxicology Program). 1985. Management Status Report. 8/7/85

Reinhardt, C.F. and M.R. Britelli. 1982. Heterocyclic and miscellaneous nitrogen compounds: Azides. In: *Patty's Industrial Hygiene and Toxicology*. Vol. 2., 3rd ed., G.D. Clayton and F.E. Clayton, Ed. John Wiley and Sons, Inc., New York. p. 2778-2822.

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### **VI.B. Inhalation RfD References**

None

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### **VI.C. Carcinogenicity Assessment References**

None

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## VII. Revision History

Substance Name — Sodium azide  
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Date	Section	Description
10/28/2003	I.A.6	Screening-Level Literature Review Findings message has been added.

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## VIII. Synonyms

Substance Name — Sodium azide  
CASRN — 26628-22-8  
Last Revised — 03/31/1987

- 26628-22-8
- AZIDE
- AZIUM
- AZOTURE DE SODIUM
- KAZOE
- NATRIUMAZID
- NATRIUMMAZIDE
- NCI-C06462
- NSC 3072
- RCRA WASTE NUMBER P105
- SMITE
- Sodium Azide
- SODIUM, AZOTURE DE
- SODIUM, AZOTURO DI
- U-3886
- UN 1687