

Nitrogen dioxide; CASRN 10102-44-0

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 Nitrogen dioxide

File First On-Line 01/31/1987

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	withdrawn; message	09/01/1994
Inhalation RfC (I.B.)	message	02/01/1993
Carcinogenicity Assessment (II.)	not evaluated	

I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

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

Substance Name — Nitrogen dioxide

CASRN — 10102-44-0

The RfD for nitrogen dioxide has been withdrawn from IRIS as of 09/01/1994 based on the fact that nitrogen dioxide does not exist per se in water, since it reacts instantaneously with water to form nitric and nitrous acids (U.S. EPA, 1993).

In the presence of alkali (pH > 7.0), nitrates and nitrites are formed, respectively, from nitric and nitrous acids. RfDs presently exist for nitrates and nitrites. As more fully explained on the IRIS files for those chemicals, the critical effect is the formation of methemoglobin resulting from the

oxidation of the ferrous iron (+2) in hemoglobin to ferric iron (+3). The inability of methemoglobin to combine with oxygen results in clinical effects due to tissue hypoxia.

U.S. EPA. 1993. Air Quality Criteria for Oxides of Nitrogen. Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Research Triangle Park, NC. EPA-600/8-91/049aF.

Agency Work Group Review — 08/19/1985, 02/26/1986, 06/24/1992, 08/04/1994

EPA Contacts:

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 (internet address).

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 nitrogen dioxide 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 or 202-566-1676.

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

Substance Name — Nitrogen dioxide
CASRN — 10102-44-0

An inhalation RfC will not be derived for nitrogen dioxide because a National Ambient Air Quality Standard (NAAQS) is available.

Agency Work Group Review — 09/19/1989

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II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Nitrogen dioxide
CASRN — 10102-44-0

Not available at this time.

III. [reserved]

IV. [reserved]

V. [reserved]

VI. Bibliography

Substance Name — Nitrogen dioxide
CASRN — 10102-44-0

VI.A. Oral RfD References

U.S. EPA. 1993. Air Quality Criteria for Oxides of Nitrogen. Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Research Triangle Park, NC. EPA-600/8-91/049aF.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — Nitrogen dioxide

CASRN — 10102-44-0

Date	Section	Description
02/01/1993	I.B.	No RfC in lieu of regulatory standard
09/01/1994	I.A.	RfD withdrawn; replaced with permanent withdrawal msg
10/28/2003	I.A.	Screening-Level Literature Review Findings message has been added.

VIII. Synonyms

Substance Name — Nitrogen dioxide

CASRN — 10102-44-0

Last Revised — 01/31/1987

- 10102-44-0
- Nitrito
- Nitro
- Nitrogen Dioxide
- Nitrogen Oxide
- Nitrogen Peroxide
- Nitrogen Tetroxide