Diethylene glycol dinitrate (DEGDN); CASRN 693-21-0

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 DEGDN

File First On-Line 02/01/1993

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	not evaluated	
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	yes	02/01/1993*

*A comprehensive review of toxicological studies was completed (07/27/05) - please see section II.D.2. for more information.

I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

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

Substance Name — Diethylene glycol dinitrate (DEGDN)
CASRN — 693-21-0

Not available at this time.

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

Substance Name — Diethylene glycol dinitrate (DEGDN)
CASRN — 693-21-0

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Diethylene glycol dinitrate (DEGDN)
CASRN — 693-21-0
Last Revised — 02/01/1993

Section II provides information on three aspects of the carcinogenic assessment for the substance in question; the weight-of-evidence judgment of the likelihood that the substance is a human carcinogen, and quantitative estimates of risk from oral exposure and from inhalation exposure. The quantitative risk estimates are presented in three ways. The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day. The unit risk is the quantitative estimate in terms of either risk per ug/L drinking water or risk per ug/cu.m air breathed. The third form in which risk is presented is a drinking water or air concentration providing cancer risks of 1 in 10,000, 1 in 100,000 or 1 in 1,000,000. The rationale and methods used to develop the carcinogenicity information in IRIS are described in The Risk Assessment Guidelines of 1986 (EPA/600/8-87/045) and in the IRIS Background Document. IRIS summaries developed since the publication of EPA's more recent Proposed Guidelines for Carcinogen Risk Assessment also utilize those Guidelines where indicated (Federal Register 61(79):17960-18011, April 23, 1996). Users are referred to Section I of this IRIS file for information on long-term toxic effects other than carcinogenicity.

II.A. Evidence for Human Carcinogenicity

II.A.1. Weight-of-Evidence Characterization

Classification — D; not classifiable as to human carcinogenicity

Basis — No human or animal carcinogenic studies found in the available literature.

II.A.2. Human Carcinogenicity Data

None.

II.A.3. Animal Carcinogenicity Data

None.

II.A.4. Supporting Data for Carcinogenicity

The in vitro transforming activity of diethylene glycol dinitrate (DEGDN) was determined with and without the addition of the chemical promoter, 12-0- tetradecanoyl phorbol 13-acetate (TPA), by the Rauscher leukemia virus- infected rat embryo cell (RLV-RE) transformation assay (Kawakami et al., 1988). DEGDN, with and without TPA, failed to transform RLV-RE cells in this short-term mammalian cell transformation assay.

DEGDN was not mutagenic for Salmonella in a mammalian microsome mutagenicity assay using strains TA97, TA98, TA100 or TA102 in the presence and absence of S9 metabolic activation over a 1000-fold DEGDN concentration range (Sano and Korte, 1988). However, in a forward mutation assay using the point mutation at the thymidine kinase locus in the mouse lymphoma cell (L5178Y TK=/-), DEGDN was shown to be a weak mutagen independent of S9 metabolic activation (Kawakami et al., 1988).

II.B. Quantitative Estimate of Carcinogenic Risk from Oral Exposure

None.

II.C. Quantitative Estimate of Carcinogenic Risk from Inhalation Exposure

None.

II.D. EPA Documentation, Review, and Contacts (Carcinogenicity Assessment)

II.D.1. EPA Documentation

Source Document — U.S. EPA, 1992

The document, Data Deficiencies, Problem Areas and recommendations for Additional database Development for Diethylene Glycol Dinitrate (DEGDN) has been reviewed by the Office of Water.

II.D.2. EPA Review (Carcinogenicity Assessment)

Agency Work Group Review — 06/02/1992

Verification Date — 06/02/1992

A comprehensive review of toxicological studies published through July 2005 was conducted. No new health effects data were identified that would be directly useful in the revision of the existing carcinogenicity assessment for Diethylene glycol dinitrate and a change in the assessment is not warranted at this time. For more information, IRIS users may contact the IRIS Hotline at hotline.iris@epa.gov or (202)566-1676.

II.D.3. EPA Contacts (Carcinogenicity Assessment)

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).

III. [reserved]
IV. [reserved]
V. [reserved]

VI. Bibliography

Substance Name — Diethylene glycol dinitrate (DEGDN)
CASRN — 693-21-0

VI.A. Oral RfD References

None

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

Kawakami T.G., A. Aotaki-Keen, L.S. Rosenblatt and M. Goldman. 1988. Evaluation of diethyleneglycol dinitrate (DEGDN) and two DEGDN containing compounds. Final Report. U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, MD. Army Project No. 84PP4856. Available from NTIS, Springfield, VA. Order No. ADA202289.

Sano S.K. and D.W. Korte Jr. 1988. Mutagenic Potential of Diethyleneglycol Dinitrate in the Ames Salmonella Mammalian Microsome Mutagenicity Test. Toxicology Series 147. Institute Report No. 292. U.S. Army Medical Research and Development Command, Fort Detrick, MD. Available from NTIS, Springfield, VA. Order No. ADA201795.

U.S. EPA. 1992. Data Deficiencies, Problem Areas, and Recommendations for Additional Database Development for Diethylene Glycol Dinitrate (DEGDN) (Final). Office of Water, Office of Science and Technology, Washington, DC.

VII. Revision History

Substance Name — Diethylene glycol dinitrate (DEGDN)
CASRN — 693-21-0

Date	Section	Description
02/01/1993	II.	Carcinogenicity assessment on-line
12/03/2002	II.D.2.	Screening-Level Literature Review Findings message has been added.
08/15/2005	II.D.2.	Screening-Level Literature Review Findings message has been removed and replaced by comprehensive literature review conclusions.

VIII. Synonyms

Substance Name — Diethylene glycol dinitrate (DEGDN)
CASRN — 693-21-0
Last Revised — 07/01/1992

- 693-21-0
- Diethylene glycol dinitrate
- DEGDN