

Methyl acrylate; CASRN 96-33-3

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 Methyl acrylate

File First On-Line 12/01/1990

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	not evaluated	
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	yes	12/01/1990

I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

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

Substance Name — Methyl acrylate
CASRN — 96-33-3

Not available at this time.

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

Substance Name — Methyl acrylate
CASRN — 96-33-3

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Methyl acrylate
CASRN — 96-33-3
Last Revised — 12/01/1990

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 — Based on inadequate evidence of carcinogenicity in animals and no human data.

II.A.2. Human Carcinogenicity Data

None.

II.A.3. Animal Carcinogenicity Data

Inadequate. The results of an inhalation study in rats were not positive.

Sprague-Dawley rats (86/sex/dose) were exposed to methyl acrylate vapor at 15, 45, or 135 ppm (53, 158 or 475 mg/cu.m) 6 hours/day, 5 days/week for 2 years (Klimisch and Reininghaus, 1984). In addition, two groups of 86 rats/sex were exposed to air and served as controls. Groups of rats were sacrificed at 12 and 18 months. A temporary retardation of body weight gain was observed in the high-dose group. Dose-related atrophy of the neurogenic portion of the olfactory epithelium (primarily the anterior portion) and a subsequent regeneration and replacement with respiratory epithelium was also observed at the highest dose (indicating that an MTD was reached). A variety of other lesions did occur; however, no differences in the incidences of preneoplastic or neoplastic lesions were observed between control and exposed groups.

II.A.4. Supporting Data for Carcinogenicity

Methyl acrylate was not mutagenic for *Salmonella typhimurium* strains TA98, TA100, TA1535, TA1537, and TA1538 with or without rat hepatic homogenates (steps were taken in some assays to limit volatility) (Waegemaekers and Bensink, 1984; Florin et al., 1980; Ishidate et al., 1981). Chromosomal aberrations were produced in Chinese hamster ovary cells following exposure to methyl acrylate vapor or in liquid suspension (Sofuni et al., 1984a; Ishidate et al., 1981). Positive results in a micronucleus test in male BALBc mice were obtained following intraperitoneal injection of 37.5-300 mg/kg (Przybojewska et al., 1984). The micronucleus test was not positive in ddY mice following the inhalation of methyl acrylate vapor at 1300 or 2100 ppm; however, an in vitro test was positive (Sofuni et al., 1984b).

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, 1987

The 1987 Health and Environmental Effects Profile for Methyl Acrylate has received OHEA review.

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

Agency Work Group Review — 11/08/1989

Verification Date — 11/08/1989

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the cancer assessment for Methyl acrylate 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.

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 — Methyl acrylate
CASRN — 96-33-3

VI.A. Oral RfD References

None

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

Florin, I., L. Rutberg, M. Curvall and C.R. Enzell. 1980. Screening of tobacco smoke constituents for mutagenicity using the Ames' test. *Toxicology*. 18: 219-232.

Ishidate, M., T. Sofuni and K. Yoshikawa. 1981. Chromosomal aberration tests in vitro as a primary screening tool for environmental mutagens and/or carcinogens. *Gann Monogr. Cancer Res.* 27: 95-108.

Klimisch, H.-J. and W. Reininghaus. 1984. Carcinogenicity of acrylates: Long-term inhalation studies on methyl acrylate (MA) and n-butyl acrylate (BA) in rats. *Toxicologist*. 4(1): 53. Abstract No. 211.

Przybojewska, B., E. Dziubaltowska and Z. Kowalski. 1984. Genotoxic effects of ethyl acrylate and methyl acrylate in the mouse evaluated by the micronucleus test. *Mutat. Res.* 135: 189-191.

Sofuni, T., M. Hayashi, A. Matsuoka, M. Sawada, M. Hatanaka and M. Ishidate. 1984a. Cytogenetic effects of gaseous and volatile chemicals on mammalian cells in vitro and in vivo. I. Chromosome aberration tests in cultured mammalian cells. *Eisei Shikensho Hokoku*. 102: 77-83. (CA 103:1939V)

Sofuni, T., M. Hayashi, A. Matsuoka, M. Sawada, M. Hatanaka and M. Ishidate. 1984b. Cytogenetic effects of gaseous and volatile chemicals on mammalian cells in vitro and in vivo. II. Micronucleus tests in mice. *Eisei Shikensho Hokoku*. 102: 84-90. (CA 103:18162J)

U.S. EPA. 1987. Health and Environmental Effects Profile for Methyl Acrylate. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Solid Waste and Emergency Response, Washington, DC.

Waegemaekers, T.H.J.M. and M.P.M. Bensink. 1984. Non-mutagenicity of 27 aliphatic acrylate esters in the Salmonella-microsome test. *Mutat. Res.* 137: 95-102.

VII. Revision History

Substance Name — Methyl acrylate

CASRN — 96-33-3

Date	Section	Description
12/01/1990	II.	Carcinogen assessment on-line
10/28/2003	II.D.2.	Screening-Level Literature Review Findings message has been added.

VIII. Synonyms

Substance Name — Methyl acrylate

CASRN — 96-33-3

Last Revised — 12/01/1990

- 96-33-3
- 2-Propenoic acid, methyl ester
- Acrilato de metilo [Spanish]
- Acrylate de methyle [French]
- Acrylic acid methyl ester
- ACRYLIC ACID, METHYL ESTER
- Acrylsaeuremethylester [German]
- HSDB 194
- Methoxycarbonylethylene
- Methyl acrylate
- METHYL ACRYLATE, inhibited
- METHYL PROP-2-ENOATE
- Methyl propenate

- Methyl propenoate
- Methyl 2-propenoate
- METHYL-ACRYLAT [German]
- METHYL-2-PROPENOATE
- Methylacrylaat [Dutch]
- METHYLESTER KYSELINY AKRYLOVE [Czech]
- Metilacrilato [Italian]
- NSC 24146
- UN 1919
- 2-Propenoic acid methyl ester
- 2-PROPENOIC ACID, METHYL ESTER