

# International Agency for Research on Cancer (IARC) - Summaries & Evaluations

## 1,2-DICHLOROETHANE (Group 2B)

For definition of Groups, see [Preamble Evaluation](#).

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CAS No.: 107-06-2

Chem. Abstr. Name: 1,2-Dichloroethane

### 5. Summary of Data Reported and Evaluation

#### 5.1 Exposure data

1,2-Dichloroethane is used mainly in the production of vinyl chloride. It is no longer registered as a fumigant. It has been detected at low levels in ambient and urban air, groundwater and drinking-water.

#### 5.2 Human carcinogenicity data

Five cohort studies and one nested case-control study of brain tumours have examined the risk of cancer among workers with potential exposure to 1,2-dichloroethane. Excesses of lymphatic and haematopoietic cancers were observed in three studies and of stomach cancer in one study, while an excess of pancreatic cancer was observed in one study. All the cohort studies included workers with potential exposure to multiple agents and were not able to examine the excess risk associated with 1,2-dichloroethane.

#### 5.3 Animal carcinogenicity data

1,2-Dichloroethane was tested in one experiment in mice and in one in rats by oral administration. In mice, it produced benign and malignant tumours of the lung and malignant lymphomas in animals of each sex, hepatocellular carcinomas in males and mammary and uterine adenocarcinomas in females. In rats, it produced carcinomas of the forestomach in males, benign and malignant mammary tumours in females and haemangiosarcomas in animals of each sex. No increase in tumour incidence was found after inhalation exposure in two experiments in rats or in one experiment in mice, but these studies were considered to be inadequate. In two other inhalation studies, one in mice and one in rats, 1,2-dichloroethane increased the incidence of tumours at various sites including the liver, lung and mammary gland.

In a multistage study measuring  $\gamma$ -glutamyl transpeptidase ( $\gamma$ -GT)-positive foci in the liver of male rats, single administration of 1,2-dichloroethane by gavage after a two-thirds partial hepatectomy followed by treatment with phenobarbital (initiation study) or repeated

administration of 1,2-dichloroethane by gavage after a two-thirds partial hepatectomy and initiation by *N*-nitrosodiethylamine (promotion study) did not increase the number of  $\gamma$ -GT-positive foci. In a two-stage mouse-skin assay, 1,2-dichloroethane was not active as an initiator of skin carcinogenicity.

#### **5.4 Other relevant data**

1,2-Dichloroethane is easily absorbed by humans and animals and is metabolized extensively by rats and mice via cytochrome P450 and glutathione *S*-transferase.

No teratogenic effect was seen in rats, rabbits or mice.

1,2-Dichloromethane is mutagenic in bacteria, *Drosophila melanogaster* and mammalian cells. It induces DNA damage in liver cells *in vivo* and binds to DNA, RNA and proteins in animals.

#### **5.5 Evaluation**

There is *inadequate evidence* in humans for the carcinogenicity of 1,2-dichloroethane.

There is *sufficient evidence* in experimental animals for the carcinogenicity of 1,2-dichloroethane.

#### **Overall evaluation**

1,2-Dichloroethane is *possibly carcinogenic to humans (Group 2B)*.

For definition of the italicized terms, see [Preamble Evaluation](#).

**Previous evaluations:** Vol. 20 (1979); Suppl. 7 (1987)

#### **Synonym**

- Ethylene dichloride

See Also:

[Toxicological Abbreviations](#)

[Dichloroethane, 1,2- \(EHC 176, 1995, 2nd edition\)](#)

[Dichloroethane, 1,2- \(EHC 62, 1987, 1st edition\)](#)

[Dichloroethane, 1,2- \(ICSC\)](#)

[Dichloroethane, 1,2- \(FAO Nutrition Meetings Report Series 48a\)](#)

[Dichloroethane, 1,2- \(WHO Food Additives Series 30\)](#)

[Dichloroethane, 1,2- \(WHO Pesticide Residues Series 1\)](#)

[Dichloroethane, 1,2- \(Pesticide residues in food: 1979 evaluations\)](#)

[Dichloroethane, 1,2- \(CICADS 1, 1998\)](#)