

## 1,2-DIETHYLHYDRAZINE

Data were last reviewed in IARC (1974) and the compound was classified in *IARC Monographs Supplement 7* (1987).

### 1. Exposure Data

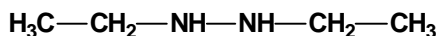
#### 1.1 Chemical and physical data

##### 1.1.1 Nomenclature

*Chem. Abstr. Serv. Reg. No.:* 1615-80-1

*Chem. Abstr. Name:* *N,N'*-Diethylhydrazine

##### 1.1.2 Structural and molecular formulae and relative molecular mass



$\text{C}_4\text{H}_{12}\text{N}_2$

Relative molecular mass: 88.2

##### 1.1.3 Physical properties (for details, see IARC, 1974)

(a) *Boiling point:* 85–86°C

(b) *Conversion factor:*  $\text{mg/m}^3 = 3.61 \times \text{ppm}$

#### 1.2 Production and use

It is unlikely that 1,2-diethylhydrazine is produced and has uses outside chemical laboratories (IARC, 1974).

### 2. Studies of Cancer in Humans

No data were available to the Working Group.

### 3. Studies of Cancer in Experimental Animals

1,2-Diethylhydrazine was tested for carcinogenicity in rats by subcutaneous administration, producing tumours of the brain, olfactory bulbs, mammary glands and liver, and by transplacental exposure, producing tumours of the brain, spinal cord and peripheral nervous system (IARC, 1974).

## 4. Other Data Relevant to an Evaluation of Carcinogenicity and its Mechanisms

### 4.1 Absorption distribution, metabolism and excretion

No data were available to the Working Group.

### 4.2 Toxic effects

No data were available to the Working Group.

### 4.3 Reproductive and developmental effects

No data were available to the Working Group.

### 4.4 Genetic and related effects

#### 4.4.1 Humans

No data were available to the Working Group.

#### 4.4.2 Experimental systems (see Table 1 for references)

1,2-Diethylhydrazine is weakly mutagenic to *Salmonella typhimurium* TA100 and particularly TA102, but only in the absence of an exogenous metabolic activation system. The activity in strain TA102 rapidly disappears with time of incubation, so that after 7 h it is halved and after 11 h, there is no activity.

## 5. Evaluation

No epidemiological data relevant to the carcinogenicity of 1,2-diethylhydrazine were available.

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

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

## 6. References

- IARC (1974) *IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man*, Volume 4, *Some Aromatic Amines, Hydrazine and Related Substances, N-Nitroso Compounds and Miscellaneous Alkylating Agents*, Lyon, pp. 153–157
- IARC (1987) *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, Supplement 7, *Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42*, Lyon, p. 62

**Table 1. Genetic and related effects of 1,2-diethylhydrazine salts**

Test system	Result <sup>a</sup>		Dose <sup>b</sup> (LED or HID)	Reference
	Without exogenous metabolic system	With exogenous metabolic system		
SA0, <i>Salmonella typhimurium</i> TA100, reverse mutation	–	–	NG	Shimizu <i>et al.</i> (1978)
SA0, <i>Salmonella typhimurium</i> TA100, reverse mutation	(+)	–	220	Matsushita <i>et al.</i> (1993)
SA7, <i>Salmonella typhimurium</i> TA1537, reverse mutation	–	–	NG	Shimizu <i>et al.</i> (1978)
SA9, <i>Salmonella typhimurium</i> TA98, reverse mutation	–	–	NG	Shimizu <i>et al.</i> (1978)
SAS, <i>Salmonella typhimurium</i> TA102, reverse mutation	+	–	NG	Matsushita <i>et al.</i> (1993)

<sup>a</sup> +, positive; (+), weak positive; –, negative

<sup>b</sup> LED, lowest effective dose; HID, highest ineffective dose; NG, not given; in-vitro tests, µg/mL

- Matsushita, H., Jr, Endo, O., Matsushita, H., Yamamoto, M. & Mochizuki, M. (1993) Mutagenicity of alkylhydrazine oxalates in *Salmonella typhimurium* TA100 and TA102 demonstrated by modifying the growth conditions of the bacteria. *Mutation Res.*, **301**, 213–222
- Shimizu, H., Hayashi, K. & Takemura, N. (1978) Relationships between the mutagenic and carcinogenic effects of hydrazine derivatives. *Jpn. J. Hyg. (Nippon Eiseigaku Zasshi)*, **33**, 474–485