TRIETHYLENE GLYCOL DIGLYCIDYL ETHER

Data were last reviewed in IARC (1976) and the compound was classified in *IARC Monographs* Supplement 7 (1987).

1. Exposure Data

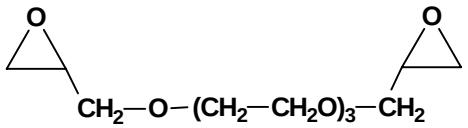
1.1 Chemical and physical data

1.1.1 *Nomenclature*

Chem. Abstr. Serv. Reg. No.:1954-28-5

Systematic name: 2,2′-(2,5,8,11-Tetraoxadodecane-1,12-diyl)bisoxirane

1.1.2 *Structural and molecular formulae and relative molecular mass*



$C_{12}H_{22}O_6$ Relative molecular mass: 262.3

1.1.3 *Physical properties* (for details, see IARC, 1976)

(*a*) *Boiling point*: 133–149°C at 13.3 Pa; 195–197°C at 266 Pa

(*b*) *Melting-point*: –15 to –11°C

(*c*) *Conversion factor*: $mg/m^3 = 10.73 \times ppm$

1.2 Production and use

Triethylene glycol diglycidyl ether was first prepared in 1962, but has been produced commercially only on a small scale in the United Kingdom for use as an antineoplastic drug given by intravenous or intraarterial injection (IARC, 1976).

2. Studies of Cancer in Humans

No data were available to the Working Group.

3. Studies of Cancer in Experimental Animals

Triethylene glycol diglycidyl ether was tested by intraperitoneal injection in a single study for lung adenoma induction in strain A mice. It increased the incidence of lung tumours at the high dose (IARC, 1976).

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

4.1 Absorption, distribution, metabolism and excretion

4.1.1 *Humans*

No data were available to the Working Group.

4.1.2 *Experimental systems*

In rats treated intravenously or subcutaneously with triethylene glycol diglycidyl ether, 75% of the dose was excreted in the urine as triethylene glycol-bis-2,3-dihydroxypropyl ether, together with a hydroxymercapturic acid and an olefinic mercapturate derived from that hydroxymercapturate. A glutathione conjugate of triethylene glycol diglycidyl ether and the corresponding cysteinylglycine and cysteine conjugates were excreted into the bile.

When this compound was incubated with rat-liver homogenates, only the cysteinylglycine conjugate was found (IARC, 1976).

4.2 Toxic effects

4.2.1 *Humans*

The severe kidney damage seen in rats and dogs after intravenous administration of triethylene glycol diglycidyl ether has not been observed in human patients; however, haematological depression (leukopenia for instance) and temporary dysuria were observed (IARC, 1976).

4.2.2 *Experimental systems*

Rats and dogs given intravenous doses of triethylene glycol diglycidyl ether showed necrosis of the renal tubule epithelium, of the adrenal cortex and of the intestinal epithelium. In dogs, blood neutrophils disappeared and lymphocyte counts fell to 50% of normal. Though the erythrocyte and platelet counts remained constant, the brief appearance of polychromatic and nucleated red cells indicated that erythropoiesis was also affected.

Testicular atrophy and decreased spermatogenesis were observed in mice after intraperitoneal injection (IARC, 1976).

4.3 Reproductive and developmental effects

No data were available to the Working Group.

4.4 Genetic and related effects

No data were available to the Working Group.

5. Evaluation

No epidemiological data relevant to the carcinogenicity of triethylene glycol diglycidyl ether were available.

There is *inadequate evidence* for the carcinogenicity of triethylene glycol diglycidyl ether in experimental animals.

Overall evaluation

Triethylene glycol diglycidyl ether is *not classifiable as to its carcinogenicity to humans (Group 3).*

6. References

IARC (1976) *IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man*, Volume 11, *Cadmium, Nickel, Some Epoxides, Miscellaneous Industrial Chemicals and General Considerations on Volatiles Anaesthetics*, Lyon, pp. 209–214

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. 73