

***cis*-9,10-EPOXYSTEARIC ACID**

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

1. Exposure Data

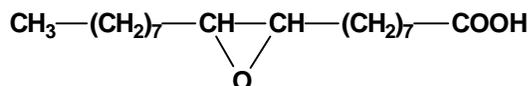
1.1 Chemical and physical data

1.1.1 *Nomenclature*

Chem. Abst. Serv. Reg. No.: 2443-39-2

Systematic name: *cis*-3-Octyl-oxiraneoctanoic acid

1.1.2 *Structural and molecular formulae and relative molecular mass*



$\text{C}_{18}\text{H}_{34}\text{O}_3$

Relative molecular mass: 298.5

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

(a) *Melting-point:* 59.5–59.8°C

(b) *Conversion factor:* $\text{mg}/\text{m}^3 = 12.29 \times \text{ppm}$

1.2 Production and use

cis-9,10-Epoxyoctanoic acid is produced only in small quantities for research purposes, but it can occur in seed oils (e.g., sunflower) upon prolonged storage (IARC, 1976).

2. Studies of Cancer in Humans

No data were available to the working group.

3. Studies of Cancer in Experimental Animals

cis-9,10-Epoxyoctanoic acid was tested for carcinogenicity in mice by skin application and subcutaneous injection, and in rats by subcutaneous injection. No significant increase in the incidence of tumours was associated with treatment (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

9,10-Epoxy stearic acid has been detected in human urine at concentrations of about 2 nmol/L (Ulsaker & Teien, 1995), probably occurring as a result of the oxidation of unsaturated fatty acid by cytochrome P450 (Laniado-Schwartzman *et al.*, 1988).

4.1.2 Experimental systems

No data were available to the Working Group.

4.2 Toxic effects

4.2.1 Humans

No data were available to the Working Group.

4.2.2 Experimental systems

Daily oral doses of *cis*-9,10-epoxy stearic acid of up to 250 mg/kg bw administered by gavage to male and female Sprague-Dawley rats did not affect growth rate, food consumption, organ weights, haematology, blood chemistry or histology. Deaths which occurred during the experiment were not substance-related, but the result of mechanical injury during dosing (Chu *et al.*, 1980).

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 data (see Table 1 for references)

cis-9,10-Epoxy stearic acid was not mutagenic in *Salmonella typhimurium* in the presence or in the absence of exogenous metabolic activation.

Table 1. Genetic and related effects of *cis*-9,10-epoxystearic acid

Test system	Result ^a		Dose (LED or HID) ^b	Reference
	Without exogenous metabolic activation	With exogenous metabolic activation		
SA0, <i>Salmonella typhimurium</i> TA100, reverse mutation	–	–	2500	Chu <i>et al.</i> (1980)
SA5, <i>Salmonella typhimurium</i> TA1535, reverse mutation	–	–	2500	Chu <i>et al.</i> (1980)
SA7, <i>Salmonella typhimurium</i> TA1537, reverse mutation	–	–	125	Chu <i>et al.</i> (1980)
SA8, <i>Salmonella typhimurium</i> TA1538, reverse mutation	–	–	2500	Chu <i>et al.</i> (1980)
SA9, <i>Salmonella typhimurium</i> TA98, reverse mutation	–	–	2500	Chu <i>et al.</i> (1980)

^a –, negative

^b LED, lowest effective dose; HID, highest ineffective dose; in-vitro tests, µg/mL

5. Evaluation

No epidemiological data relevant to the carcinogenicity of *cis*-9,10-epoxystearic acid were available.

There is *inadequate evidence* in experimental animals for the carcinogenicity of *cis*-9,10-epoxystearic acid.

Overall evaluation

cis-9,10-Epoxystearic acid is *not classifiable as to its carcinogenicity to humans* (Group 3).

6. References

- Chu, I., Villeneuve, D.C., Nestmann, E.R., Douglas, G., Becking, G.C., Lough, R. & Matula, T.I. (1980) Subacute toxicity and mutagenicity of *cis*-9,10-epoxystearic acid. *Bull. environ. Contam. Toxicol.*, **25**, 400–403
- IARC (1976) *IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man*, Vol. 11, *Cadmium, Nickel, Some Epoxides, Miscellaneous Industrial Chemicals and General Considerations on Volatile Anaesthetics*, Lyon, pp. 153–156
- 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. 63
- Laniado-Schwartzman, M., Davis, K.L., McGiff, J.C., Levere, R.D. & Abraham, N.G. (1988) Purification and characterization of cytochrome P-450-dependent arachidonic acid epoxygenase from human liver. *J. biol. Chem.*, **263**, 2536–2542
- Ulsaker, G.A. & Teien, G. (1995) Identification of 9,10-epoxyoctadecanoic acid in human urine using gas chromatography-mass spectrometry. *Biomed. Chromatogr.*, **9**, 183–187