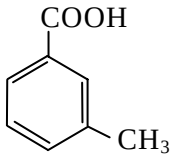
SIDS INITIAL ASSESSMENT PROFILE

CAS No.	99-04-7
Chemical Name	*m*-Toluic acid
Structural Formula	

SUMMARY CONCLUSIONS OF THE SIAR

Human Health

m-Toluic acid is metabolized to methylhippuric acid and rapidly excreted in the urine.

The acute oral toxicity of the substance is relatively low. The oral LD_{50} in rats is greater than 2,000 mg/kg bw. At 2,000 mg/kg no animals died, no clinical signs, no effect on body weight gain, and no macroscopical changes were observed.

This substance is considered to be not irritating to skin. The sensitizing effect of *m*-toluic acid is not clear due to the lack of reliable data, but this substance might potentially be a sensitizer.

A combined repeated dose toxicity study with the reproduction/developmental toxicity screening test [OECD TG 422] was conducted in rats at the doses of 0 (vehicle), 30, 100, 300 and 1,000 mg/kg/day administered by gavage. For males, the adverse effects, such as a decrease in locomotor activity, extension of prothrombin time, decrease in platelet, increase in GOT and increase in relative weight of the pituitary were observed at 1,000 mg/kg/day. For females, an increase in relative and absolute liver weight associated with periportal hepatocellular vacuolar degeneration (7/10) were observed at 1,000 mg/kg/day. Histological changes were observed (3/10) in the 300 mg/kg/day group. The NOAEL for the repeat dose toxicity is considered to be 300 mg/kg/day for males, and 100 mg/kg/day for females based on the adverse effects in the liver.

Two independent bacterial gene mutation tests [OECD TG 471 and 472] gave negative result with and without metabolic activation. In a chromosomal aberration test with Chinese hamster cultured cells (CHL/IU) [OECD TG 473], a little higher incidence of cells with chromosomal aberrations was observed, and this test gave equivocal results. Moreover, an *in vivo* micronucleus assay using rats [OECD TG 474], tested up to 2000 mg/kg, gave negative results. Considering these points, the chromosomal aberrations observed *in vitro* seems not to occur in the animal body.

In the above-described combined repeated dose toxicity study with the reproduction/developmental toxicity screening test [OECD TG 422], there were no signs of reproduction/developmental toxicity on the gestation index, numbers, sex ratio, or viability of pups up to 1,000 mg/kg/day. The NOAEL of the reproduction/developmental toxicity is considered to be 1,000 mg/kg/day.

Environment

m-Toluic acid is white to yellowish crystal, which is soluble in water (1 g/L at 25 °C). Melting point, boiling point, and vapour pressure are 111.7 °C, 263 °C, and 0.00019 hPa (25 °C), respectively. *m*-Toluic acid is readily

biodegradable [OECD TG 301C: BOD = 91 % after 28 days] and its bioaccumulation potential seems to be low based on its log Kow (2.37 at 25 °C). Indirect photo-oxidation by hydroxy radicals is predicted to occur with a half-life estimated at 63 hours. Hydrolysis is not expected to occur. Fugacity modeling (Mackay level III) predicts that if *m*-toluic acid is released to water and soil, it is unlikely to distribute into other compartments. When *m*-toluic acid is released to air, 2.1% stays in air and 15.6 % is transported to water and 82.2 % is transported to soil. This substance is weakly acidic (pKa = 4.27) and can be regarded as a non-dissociated molecule for the calculations with the fugacity model.

m-Toluic acid has been tested for the toxicity with species of three trophic levels. Acute toxicity tests were conducted with algae, daphnids and fish. The 72 h EC50 in algae (*Selenastrum capricornutum*) was 10 mg/L (biomass) or 15 mg/L (growth rate) [OECD TG 201]. The 48 h EC50 in daphnids (*Daphnia magna*) was 75 mg/L [OECD TG 202 part 1]. The 96 h LC50 in fish (*Oryzias latipes*) was 82 mg/L [OECD TG 203]. Two chronic toxicity results in algae (*Selenastrum capricornutum*) and daphnids (*Daphnia magna*) were available. For algae, a 72 h NOEC on growth inhibition of 2.2 mg/L (biomass) or 10 mg/L (growth rate), and for daphnids a 21 d NOEC for reproduction of 9.7 mg/L were reported. Algae are the most sensitive aquatic organisms among three trophic levels according to acute values.

Exposure

The production volume of *m*-toluic acid was estimated at approximately 250 t/year in Japan and 2,600 t/year world-wide in 2000. *m*-Toluic acid is produced in a closed system. Normal practice of production/conversion in Japan include sewage treatment to prevent environmental exposure to this substance. This chemical is used almost entirely as a chemical intermediate in the chemical industry to make an insect repellent used by humans. A very small portion of the product (c.a. 1%) is converted to a plastic stabilizer. During production and use of this substance, occupational exposure is possible by inhalation and dermal route.

RECOMMENDATION

The chemical is currently of low priority for further work.

RATIONALE FOR THE RECOMMENDATION AND NATURE OF FURTHER WORK RECOMMENDED

The chemical possesses properties indicating a hazard for the environment. Based on data presented by the Sponsor country, exposure to humans and the environment is anticipated to be low, and therefore this chemical is currently of low priority for further work. Countries may desire to investigate any exposure scenarios that were not presented by Sponsor countries.