# SIDS INITIAL ASSESSMENT PROFILE

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| **CAS No.** | 79-00-5 |
| **Chemical Name** | 1,1,2-Trichloroethane |
| **Structural Formula** | $Cl_2CH\text{-}CH_2Cl$ |

## SUMMARY CONCLUSIONS OF THE SIAR

### Human Health

The acute toxicity (LD50) of 1,1,2-trichloroethane is 837 mg/kg by oral administration in rats, 9 $g/m^3$ /6 hr by inhalation in rats and 5.38 g/kg by dermal administration in rabbits. This chemical is considered to be irritating to skin, eyes, the upper respiratory tract and the stomach. There is no available information on skin sensitisation.

In a 90 days drinking water study of mice at the concentration of 0, 20, 200, or 2,000 mg/l, a reduction of P-450 contents in liver were observed and the NOEL was considered to be 3.9 mg/kg/day. Repeated inhalation exposure (7 hours/day, 5 days/week) to 83 $mg/m^3$ air for 6 months did not lead to any chemical-related changes in the rat, guinea pig and rabbit. The daily intake is equivalent to roughly 11 mg/kg/day in rats, 7.4 mg/kg/day in guinea pigs, and 25 mg/kg/day in rabbits. In humans, this chemical was reported to act as a narcotic at low concentrations, and to irritate the conjunctiva, the mucosa of the respiratory tract and the external skin. Moreover, gastrointestinal tract complaints, fatty degeneration of the kidneys and lung damage by prolonged exposure were reported.

A carcinogenicity study with this chemical by gavage showed hepatocellular carcinomas and pheochromocytomas in mice but the chemical was not carcinogenic in rats. Initiation/promotion screening studies on male rat liver demonstrated that this chemical has neither initiation nor promotion activity. A carcinogenicity study in skin of rats given 0, 2.05 or 6.24 mg by subcutaneous injection once a week for two years indicated no chemical related changes.

A bacterial mutagenicity study showed negative results in all strains of *Salmonella typhimurium* TA1535, TA1537, TA1538, TA98, TA100 with and without metabolic activation. Unscheduled DNA synthesis was not observed in livers of treated mice. On the other hand, a mutation study in *Saccharomyces cerevisiae* and an *in vitro* micronucleus test with human lymphocytes was positive. However, the latest micronucleus test in mice *in vivo* showed negative results. Therefore the weight of evidence suggests that this chemical is not genotoxic *in vivo*.

In a developmental toxicity study, the chemical was administered by gavage to mice on days 8 through 12 of gestation at dose of only 350 mg/kg/day. Any changes including teratogenicity and embryo/fetal viability, and/or postnatal growth and viability were not observed. Therefore, the NOEL for developmental toxicity was considered to be 350 mg/kg/day.

### Environment

1,1,2-Trichloroethane is a stable liquid and is not readily biodegradable (OECD TG 301C). Its measured bioconcentration factor is 0.7 – 4.0 (OECD TG 305C).

As the lowest acute toxicity test results for algae, zooplankton and fish, a 96 h-EC50 for *Phaeodactylum tricornutum* (60 mg/l), a 48 h EC50 for *Daphnia magna* (18 mg/l) and a 7 d LC50 for *Poecilia reticulata* (40 mg/l) were selected. As the lowest chronic toxicity test results for algae, zooplankton and fish, a 72 h NOEC (growth) for *Selenastrum capricornutum* (51.4 mg/l), a 21d NOEC (reproduction) for *Daphnia magna* (32 mg/l) and a 56d NOEC (mortality during early life stage) for *Pleuronectes platessa* (3.0 mg/l) were selected. An assessment factor of 10 was used on

the chronic toxicity data to determine a PNEC, which is 0.3 mg/l in the present report.

**Exposure**

The production volume of this chemical was ca. 153,000 tonnes/year in 1996 in Japan. This chemical is used as an intermediate for the production of vinylidene chloride and is not included in consumer products in the Sponsor country. The potential environmental distribution of 1,1,2-trichloroethane obtained from a generic fugacity model (Mackey level III) showed that this chemical would be distributed mainly to air and water. The main route of human exposure is inhalation with a limited number of workers potentially exposed during sampling, subsequent analysis, tank filling and maintenance operations.

## RECOMMENDATION

The chemical is currently of low priority for further work.

## RATIONALE FOR THE RECOMMENDATION AND NATURE OF FURTHER WORK RECOMMENDED

As the original recommendation was "An i*n vivo* genotoxicity study such as an *in vivo* micronucleus test is recommended because an *in vitro* chromosomal aberration test indicates clear positive results", an *in vivo* micronucleus test was conducted as post-SIDS work. Based on the negative result, this chemical is currently of low priority for further work.