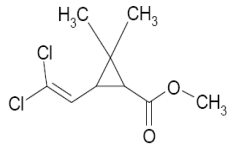
SIDS INITIAL ASSESSMENT PROFILE

CAS No.	61898-95-1
Chemical Name	Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester
Structural Formula	

SUMMARY CONCLUSIONS OF THE HAZARD CHARACTERIZATION

NOTE: The conclusions in this document are based on considerations of comments from OECD member countries and the Hazard Characterization and Robust Summary documents published in September 2008 by the United States in the US HPV Chemicals Program (http://iaspub.epa.gov/oppthpv/hpv_hc_characterization.get_report?doctype=1). The SIDS endpoints requested in the US HPV Chemicals Program are equivalent to those evaluated in the OECD HPV Chemicals Program.

Reduced Testing Rationale

Testing for the repeated-dose and reproductive toxicity endpoints was waived because cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester is a closed-system intermediate (CSI); the chemical is isolated at the production plant, is shipped in drums or tank trucks and is then used as a starting material for the production of pyrethroid insecticides in the sponsor country. However, reproductive toxicity was assessed in the reproductive/developmental toxicity screening test [OECD TG 421].

Physical-Chemical Properties

Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester is a clear, colourless liquid at room temperature with a melting point of 28 °C (estimated), a boiling point of 78 °C at 0.6 mm Hg (0.80 hPa)and a measured vapour pressure of 0.04 hPa at 25 °C. The measured octanol-water partition coefficient (log K_{ow}) is 3.66 and the water solubility is 53 mg/L (measured) at 25 °C.

Human Health

Toxicokinetics data are not available.

The oral LD_{50} value for cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester was > 5000 mg/kg bw in male and female rats following gavage administration. Clinical signs included abdominogenital staining, ataxia, chromodacryorrhea, chromorhinorrhea, cyanosis, diarrhea, exophthalmos, lacrimation, decreased locomotion, oral discharge, prostration and recumbency. One female died within 3 days following dosing. The inhalation LC_{50} value was > 0.35 mg/L in male and female rats following 6 hours of exposure to saturated vapour of cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester. Clinical signs included squinting eyes, excessive lacrimation, red perinasal fur and irregular breathing patterns.

No experimental data are available for irritation or sensitisation studies in animals.

Repeated-dose toxicity data are not required in the U.S. HPV Chemical Challenge Program because the chemical is a CSI.

In a bacterial reverse mutation assay (Ames test) with multiple strains of *Salmonella typhimurium*, cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester was negative both with and without metabolic activation. An *in vitro* chromosomal aberration test [OECD TG 473] using cultured Chinese hamster lung cells was negative with and without metabolic activation. Based on these results, cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester is considered to be non genotoxic *in vitro*.

No data are available for the carcinogenicity of cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester.

Although not required because the chemical is a CSI, the reproductive toxicity was assessed in the reproductive/developmental toxicity screening test in rats [OECD TG 421]. In this study, cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester was administered via gavage to rats of both sexes at 0, 50, 450 or 900 mg/kg-bw/day. Male rats were administered the test substance from 2 weeks before mating to the end of mating period (28 days total). Females were administered the test substance from 2 weeks before mating, during mating through gestation and up to day 3 post partum (54 days total). There was a high incidence of salivation in both sexes at 450 and 900 mg/kg-bw/day. Two moribund females were sacrificed at 900 mg/kg-bw. There were no treatment-related changes in body weight, food consumption, necropsy finding, male reproductive organ weights or histopathological findings. An increase in perinatal deaths, decreased number and body weights of live young at birth, and decreased litter size were observed at 900 mg/kg-bw/day. No treatment-related effect was seen in gestation length, viability index, sex ratio, number of pups with gross lesions, or pups with abnormally low body weights. Based on mortality, the NOAEL and LOAEL for maternal toxicity was considered to be 450 and 900 mg/kg- bw/day, respectively. The NOAEL and LOAEL for developmental toxicity was considered to be 450 and 900 mg/kg-bw/day, respectively, based on decreased litter size and body weights and increased mortality in offspring.

Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester possesses properties indicating a hazard for human health (developmental toxicity only at high doses). Adequate screening-level data are available to characterize the human health hazard for the purposes of the OECD HPV Programme.

Environment

The hydrolysis half-life for cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester is 17 years at pH 7 (estimated). In the atmosphere, indirect photo-oxidation by reaction with hydroxyl radicals is predicted to occur with a half-life of 2.4 days. A closed bottle OECD TG 301D resulted in 0 % biodegradation after 28 days. Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester is not readily biodegradable under aerobic conditions.

A level III fugacity model calculation with equal and continuous distributions to air, water and soil compartments suggests that cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-,methyl ester will distribute mainly to the soil (73.7 %) and water (21.4%) compartments with minor distribution to the air compartment (3.53%) and sediment compartment (1.42%). An estimated Henry's law constant of 1.63×10^{-4} atm-m^3/mol (16.5 Pa- m^3/mol) suggests that a potential for volatilization from the water phase is not expected to be high. A K_{oc} of 285.7 was estimated. The bioaccumulation potential seems to be low based on a log K_{OW} of 3.66 supported by an estimated log BCF value of 0.803 (BCFBAF v3.00).

The following acute toxicity test results have been determined for aquatic organisms:

Fish [*Oncorhynchus mykiss*] 96 h LC_{50} = 3.01 mg/L (measured)
Aquatic Invertebrate [*Daphnia magna*] 48 h LC_{50} = 7.04 mg/L (measured)
Algae [*Pseudokirchneriella subcapitata*] 72 h ErC_{50} = 8.3 mg/L (measured)

Algae [*Pseudokirchneriella subcapitata*] 72 h EbC_{50} = 5.2 mg/L (measured)

Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, methyl ester possesses properties indicating a hazard for the environment (acute toxicity to fish, invertebrates and algae from 1 to 100 mg/L). Although this chemical is not readily biodegradable, it has a limited potential for bioaccumulation. Adequate screening-level data are available to characterize the environmental hazard for the purposes of the OECD HPV Programme.

Exposure

Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-methyl ester is commercially produced with an annual production volume of approximately 4536 metric tons (2002) in the United States. Worldwide production volume is not available. Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-methyl ester is only used as a closed system intermediate.

The chemical is manufactured and processed in systems that are expected to reduce the potential for worker exposure and environmental releases. No commercial or consumer uses have been identified. Therefore, consumer exposure is not expected.