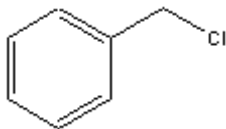


SIDS INITIAL ASSESSMENT PROFILE

CAS No.	100-44-7
Chemical Name	Benzyl chloride
Structural Formula	

CONCLUSIONS AND RECOMMENDATIONS**Environment**

The chemical is hydrolyzed to benzyl alcohol in a temperature dependent manner in aquatic environment and benzyl alcohol is readily biodegradable. The chemical has high toxicity to aquatic organisms. However, toxicity of benzyl alcohol is low. Although PEC/PNEC ratio of the chemical is greater than 1 based on the local exposure scenario in the Sponsor country, PEC/PNEC ratio of benzyl alcohol is considered to be less than 1. Therefore, it is currently considered of low potential risk generally, but the environmental fate and degree of hydrolysis should be considered by each country.

Human Health

The chemical is toxic in a repeated dose study (i.e. stomach, heart, liver) and carcinogenic in rats (thyroid) and mice (liver, stomach, lung). Genotoxicity of the chemical seems weakly positive. The chemical is also considered as an irritant to skin, eyes and respiratory system. The chemical is considered as a possible carcinogen although there is no clear evidence in human. There is no available information on consumer use. As the chemical is rapidly hydrolyzed to benzyl alcohol in water phase, health risk via environment was assessed as benzyl alcohol exposure. As margin of safety for indirect exposure is more than 5×10^5 , it is currently considered of low potential risk for the population via the environment. Depending on the current exposure situation further risk management in the workplace may be necessary or considered by countries.

SHORT SUMMARY WHICH SUPPORTS THE REASONS FOR THE CONCLUSIONS AND RECOMMENDATIONS

Benzyl chloride is liquid at room temperature and the production volume is ca. 7,700 tonnes/year in 1993 in Japan. The chemical is used as intermediate for organic synthesis (benzyl alcohol, dyes and perfumes). No consumer use is reported. The chemical is classified as "readily biodegradable". In a Japanese environmental survey, the chemical was not detected from surface water, sediments and biota in 1977 and 1990.

The potential environmental distribution of benzyl chloride obtained from a generic fugacity model (Mackey level III) showed the chemical will be distributed mainly to air and water. Predicted environmental concentration (PEC_{local}) of the chemical was estimated as 1.8×10^{-3} mg/l from Japanese local exposure scenario.

The main route of occupational exposure is inhalation with workers potentially exposed during drum and tank filling operation. The daily intake was estimated to be 0.096 mg/kg/day as the worst case, based on the average atmosphere concentration. As for indirect exposure via the environment, the assessment was conducted on assumption that all of benzyl chloride would be converted to benzyl alcohol and the environmental concentration would be the same of the predicted benzyl chloride concentration because benzyl chloride is rapidly hydrolysed to benzyl alcohol in water

phase. The daily intakes through drinking water and fish are estimated as 6.00×10^{-5} mg/kg/day and 1.35×10^{-4} mg/kg/day, respectively, based on the highest predicted environmental concentration of 1.80×10^{-3} mg/l.

As the lowest acute toxicity data to each of algae, zooplankton and fish, 96 h-EC₅₀ of *Selenastrum capricornutum* (19.3 mg/l), 48 h-EC₅₀ of *Daphnia magna* (3.2 mg/l) and 14 d-LC₅₀ of *Poecilia reticulata* (0.39 mg/l) were selected. As the lowest chronic toxicity data to algae and zooplankton, 72 h-NOEC (growth) of *Selenastrum capricornutum* (10.0 mg/l) and 21d-NOEC (reproduction) of *Daphnia magna* (0.1 mg/l) were adopted. Therefore, the assessment factors of 100 were applied to both acute and chronic toxicity data to determine PNEC, according to the OECD Provisional Guidance for Initial Assessment of Aquatic Effects, because chronic toxicity data for fish was absent. Thus, PNEC of benzyl chloride is 0.001 mg/l. PEC/ PNEC ratio (1.8) of the chemical is greater than 1. However, the PEC/PNEC ratio of benzyl alcohol (0.015), which is a hydrolyzed product of the chemical, is expected to be less than 1. It is currently considered 'needs further work on environmental fate'.

Benzyl chloride is considered as an irritant to the skin, eye, respiratory system and some evidence of sensitization exists. Major toxicity of the chemical in subchronic study was the tissue damage in the heart and stomach, and a slight developmental change was observed on fetus. The no observed effect level was as 6.4 mg/kg/day for repeated dose toxicity and 50 mg/kg/day for developmental toxicity, respectively. As for benzyl alcohol, the no observed effect level was 100 mg/kg/day in a subchronic study and neoplastic changes were not observed in a two year carcinogenicity study.

For non-cancer endpoint, occupational risk is considered to be low because a margin of safety is calculated to be 66.7 as the worst case. There is no available information on consumer exposure. The margin of safety of benzyl alcohol for drinking water or fish was calculated as 1.67×10^6 or 7.41×10^5 , based on no observed effect level of 100 mg/kg/day. As the margin of safety for benzyl alcohol via indirect exposure is sufficient, it is currently considered of low potential human risk.

In carcinogenicity study, thyroid C-cell adenoma/carcinoma in female rats and hemangioma/hemangiosarcoma, forestomach carcinoma/papilloma in male mice and forestomach carcinoma/papilloma, lung alveolar-bronchiolar adenoma/carcinoma in female mice were observed in a dose-dependent manner. Hepatocellular carcinoma/adenoma was observed in only male mice in none dose-dependent manner. *In vitro* genotoxicity study showed negative or weakly positive and *in vivo* micronucleus test presented the negative result. Therefore the possibility of occupational cancer risk could not be excluded.

NATURE OF FURTHER WORK RECOMMENDED

Depending on the current exposure situation further risk management in the workplace may be necessary or considered by countries.