# SIDS INITIAL ASSESSMENT PROFILE

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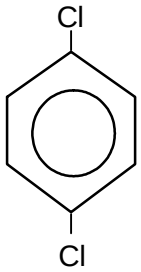
| **CAS No.** | 106-46-7 |
| **Chemical Name** | 1,4-Dichlorobenzene |
| **Structural Formula** |  |



## SUMMARY CONCLUSIONS OF THE SIAR

### Human Health

For toxicological endpoints, absorption of 1,4-dichlorobenzene (1,4-DCB) occurs rapidly via the digestive and respiratory tract. 1,4-DCB is of low acute inhalation, oral and dermal toxicity. Human ocular and nasal irritation appears from 50 ppm; human respiratory irritation appears from 160 ppm.

Regarding sensitisation, the interpretation of the results of the maximisation tests is difficult in view of the low concentration used. In humans only one questionable case was reported despite the widespread use of the 1,4-DCB. Therefore, a low sensitising potential can be anticipated.

The NOAEL was 75 ppm for inhalation repeated dose toxicity (76 weeks and 2 years) in mice and rats with slight liver and kidney effects from 158 ppm. The NOAEL was 10 mg/kg bw/day from a one-year oral dog study with liver effects observed from 50 mg//kg bw/day.

For genotoxicity, the so-called standard tests (*in-vitro* and *in-vivo*) do not suggest that 1,4-DCB has any genotoxic potential ; but evidence pointing in this direction comes from non standard tests (comet assay, DNA-adducts).

For carcinogenicity, renal adenocarcinomas were observed in male rats from 150 mg/kg bw/day, the underlying mechanism being male rat specific hyaline droplet nephropathy. Hepatocarcinoma associated in some animals with hepatoblastomas and histiocytosarcomas appeared in B6C3F1 mice from 600 mg/kg bw/day in a two year gavage study and in BDF1 mice from 300 ppm in a two year inhalation study at doses where hepatotoxicity was observed. It has to be noted that mice are of very high sensitivity towards hepatotoxic chemicals. Even if the mechanism by which these liver tumours are induced has not been clearly identified, a threshold mechanism for 1,4-DCB is proposed and NOAELs determinated : 75 ppm in BDF1 mice and 300 mg/kg bw/day in B6C3F1 mice.

No toxicity to fertility was observed (rat, inhalation exposure up to 538 ppm and oral exposures up to 270 mg/kg bw/day). For developmental toxicity, no increased risks to offspring were observed in the absence of parental effects (3 studies: rat oral up to 1000 mg/kg bw/day, rat inhalation up to 508 ppm and rabbit inhalation up to 800 ppm) except in a two generation study in rats by gavage where effects were observed from 90 mg/kg bw/day, with more severe effects at 270 mg/kg bw/day (dose with maternal toxicity). The effects seen were a reduced mean body weight in pups at birth and an increased total number of pups decreased between 1-4 (both reversible and in one out of 2 generations).

**Environment**

1,4-Dichlorobenzene is "readily biodegradable" and has a high potential for accumulation (Koc = 155 - 748; BCF = 55 - 1400).

For algae, EC50 values range from 1.6 mg/l (96 hours) to 34.3 mg/l (48 hours). For daphnids, acute toxicity results range from an EC50 (48 hours) of 0.7 mg/l to an EC50 (24 hours) of 3.2 mg/l. Regarding long-term effect tests, a NOEC of 0.22 mg/l (28-day) was observed. Acute toxicity to fish ranges from an LC50 (96 hour) of 1.12 mg/l for rainbow trout to an LC50 (96 hours) of 14.2 mg/l for fathead minnow. In early life stage testing, a NOEC (14-16 day, *Joranella floridae*) of 0.2 mg/l was observed. For soil dwelling organisms, the 14-day LC50 was 128-229 mg/kg dw for *Eisenia andrei*. For terrestrial plants ,the 14-day EC50 was 213-248 mg/kg dw for *Lactuca sativa*.

Long-term test results are available with aquatic species from three trophic levels and the PNEC for the aquatic compartment is estimated to be 20 µg/l.

**Exposure**

The worldwide consumption volume of 1,4-dichlorobenzene was ca. 113 000 t/a in 1989, with a general decreasing tendency. The consumption in the EU in 1994 is estimated to be 15000 t/a. It is mostly used as an intermediate for the production of dichloronitrobenzene and also directly as a moth repellent or air freshener.

## RECOMMENDATION

The chemical is a candidate for further work.

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

In the context of the EU Existing Substances Regulation 793/93, a risk reduction strategy is being developed for this substance as a consequence of concerns about human health risks. OECD Member countries outside the EU are invited to take note of this strategy and to investigate the necessity for risk assessment in their own countries.