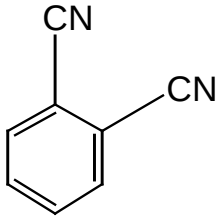
SIDS INITIAL ASSESSMENT PROFILE

CAS No.	91-15-6
Chemical Name	o-Phthalodinitrile
Structural Formula	

RECOMMENDATIONS

The chemical is currently of low priority for further work.

SUMMARY CONCLUSIONS OF THE SIAR

Human Health

The chemical is acutely toxic by ingestion (rat oral LD_{50}: 85 mg/kg bw). The major effect is neurotoxicity. No mortality by inhalation occurred in rats exposed to saturated atmosphere with low dust formation for 8 hrs at 20 °C. It is considered as non-irritating to the skin and eyes. There are no available information on skin sensitization. In compliance with an OECD combined repeat dose and reproductive/ developmental toxicity screening test [TG 422], the chemical was given to male and female rats by gavage at doses of 0, 1, 6, 30 mg/kg bw /day for at least 42 days. Histopathological examination for the males of 30 mg/kg bw /day revealed centrilobular hypertrophy of hepatocytes in the liver, hyaline droplets in the proximal tubular epithelium, basophilic degeneration of the renal tubules and atrophy of the seminiferous tubules with cell debris in the tubules. In addition, the number of sperm in the epididymis significantly decreased in males of 30 mg/kg bw /day. No adverse effects were observed at 6 mg/kg bw/day. In a 13-week oral feeding study with rats conducted according to OECD TG 408 and US EPA guideline for neurotoxicity study, a reduced body weight gain which correlated with a reduced feed consumption was described. The substance caused an increase in motor activity, but no macroscopical or neurohistopathological correlations were found in the central and peripheral nervous system. Clouding of the lens was detected in eye examinations at the end of the study in both sexes in the high dose group and in some females in the intermediate dose group, an effect that was not evident after 4 weeks. Therefore the NOAEL for repeat dose toxicity was prescribed 3 mg/kg bw/day.

For gene mutations, the test results were uniformly negative with and without an exogenous metabolic activation system in bacteria as well as mammalian cells, while the cytogenetic effect was judged to be positive in mammalian cells *in vitro* because of an increase of polyploid cells. However, this chemical did not show any cytogenetic effects in the well-planned *in vivo* micronucleus test. A weight of evidence suggests this chemical is not genotoxic *in vivo*.

In the above screening test [OECD TG 422], this chemical was given from 14 days before mating to 14 days after mating in males and from 14 days before mating to day 3 of lactation in females. As all dams from the 30 mg/kg group died in late pregnancy, no data were obtained for after-delivery parameters. In the 1 mg/kg and 6 mg/kg groups, no changes due to administration of the chemical were observed. Therefore NOAEL for reproductive toxicity is considered to be 6 mg/kg/day in males and females. Any developmental toxicity including teratogenicity

was not observed up to 6 mg/kg/day.

Available data (on carcinogenicity) were found to be invalid.

Old report indicates that irritation of skin and mucous membranes and cases of acute intoxication with dizziness, vomiting, unconsciousness, epileptiforme convulsions, and retrograde amnesia were described in workers after exposure to skin and by inhalation during handling. However, a morbidity and a mortality study, and chromosome examinations in workers showed no abnormal findings.

Environment

This chemical has been tested in a limited number of aquatic species including fish, *Daphnia* and algae. For algae, acute toxicity values are 68 and 421 mg/L (72 h EbC_{50}) in *Selenastrum capricornutum* and *Scenedesmus subspicatus*, respectively. NOEC (72 h, biomass) of *Selenastrum* is 31.6 mg/L. For *Daphnia magna*, the acute toxicity values are 211 and 219 mg/L (48 h EC_{50} for immobilization), and the chronic value is 14 mg/L (21d NOEC for reproduction). For fish, only acute data are available; 96 h LC_{50} (*Oryzias latipes*) is 22.6 mg/L. PNEC of 0.14 mg/L for the aquatic organisms is calculated from 21 d-NOEC for *Daphnia* (14 mg/L) using an assessment factor of 100. This chemical is considered to be harmful to aquatic organisms.

Exposure

The production volume of this chemical in BASF AG Ludwigshafen, Germany was 1,000-5,000 t in 1999. The production volume is used as an intermediate (non disperse use) in chemical industry.

The substance is soluble in water (0.56g/l at 25 °C) and has no considerable potential for bio- and geoaccumulation. (BCF < 5.5, measured; log Kow=0.582 at 25°C) and turned out to be not readily biodegradable (OECD 301 E: 56-59 % after 4 days). However according to OECD 302 B the substance is inherently biodegradable with adapted inoculum (90-100 % after 12 days). In the atmosphere it is photodegraded very slowly (t1/2 = 350 d). Under environmental conditions no hydrolysis was observed. Distribution modeling using Mackay I indicates water to be the target compartment (99.4%) followed by air (0.6 %).

NATURE OF FURTHER WORK RECOMMENDED

O-Phthalodinitrile is an acute neurotoxicity hazard with effects seen at relatively low doses.

The chemical is a low priority for further work taking into consideration that it is manufactured at one site as a chemical intermediate. The SIAM was informed that exposure is adequately controlled at this site.