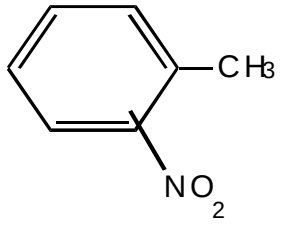
SIDS INITIAL ASSESSMENT PROFILE

CAS No.	88-72-2
Chemical Name	*o*-Nitrotoluene
Structural Formula	

CONCLUSIONS AND RECOMMENDATIONS

Potential for risk to man due to genotoxicity and thus presumed carcinogenicity. Some difficulties over classification based on mesotheliomas in 90-day study and Sweden has requested this be considered urgently.

Manufacturers should be contacted regarding product stewardship and the preparation of a status report.

SHORT SUMMARY WHICH SUPPORTS THE REASONS FOR THE CONCLUSIONS AND RECOMMENDATIONS

2-Nitrotoluene (2NT) is predominately used as raw material for the synthesis of explosives, pharmaceuticals, colourants, dyes, rubber, petrochemicals and pesticides. A single non-reactant use of 2-NT as a solvent in pigment manufacturing process is identified. 2NT has not been identified in consumer products.

2NT may enter the environment via the air and waste water emissions during its production and/or use as a reactant in the production of products. If released to soil, 2NT may be resistant to oxidation and chemical hydrolysis. 2NT is predicted to be moderately to highly mobile in soil and volatilise slowly from dry soil surfaces. If released to water, 2NT may be subject to direct photolysis, indirect photolysis (half life < 1 hour), volatilisation (half life, 21 hours) and possibly aerobic biodegradation (with acclimation). Based upon monitoring data, the half life of 2NT in a river 4-5m deep has been estimated to be 3.2 days. If released to the atmosphere, 2NT is expected to exist entirely in the vapour phase, with the principle removal mechanisms being reaction with hyrdoxyl radicals. (half life 8 hours) and direct photolysis. BCF values of 100, 33 and 16 have been calculated, and taken in consideration with the log Pow value of 2.3, it is expected that 2NT would not significantly bioaccumulate in aquatic organisms.

The anticipated ecotoxicological hazards posed by 2NT are low/moderate acute and chronic toxicity to aquatic and terrestrial organisms. The MTC (maximum tolerable concentration) for aquatic organisms has been calculated from the lowest observed NOEC, 0.5 mg/l (*Daphnia magna*). Using an assessment factor of 10 the derived MTC_{aq} is 0.050 mg/l = 50 µg/l. For environmental risk, local "worst case" PECs have been calculated for a single factory scenario under climatical conditions expected to be normal at a Swedish production/processing site. The calculated PECs are: for air =< 1.5×10^{-4} mg/m^3; soil =< 0.043 µg/l; water =< 9.2 µg/l, and; sediment =< 23 µg/l. Local PEC/MTC estimates indicate that 2NT may not cause effects upon organisms in the aquatic environment.

In animal studies 2NT was not corrosive or irritating to the rabbit skin and eye(s). Studies concerning the skin sensitisation potential of the substance have not been located.

2NT is moderately toxic by the oral route but only slightly toxic by the inhalatory and dermal routes. Repeat dose toxicity studies have been performed via the oral route. Effects on the liver, kidney, reproductive system, lung and haematopoietic/splenic system have been observed in rats and on the liver and nasal cavity in mice. In repeated dose studies hepatotoxicity was considered the most sensitive toxicological marker and LOAEL is set at 45 mg/kg for rats and NOAEL at 104 mg/kg for mice.

2NT was negative in *Salmonella* mutagenicity test and *in vitro* chromosomal aberration test but produced SCE in the presence of metabolic activation. *In vivo*, 2NT was genotoxic (UDS; covalent binding). An *in vivo* chromosomal aberration study is not available. A 13 week study demonstrated 2NT to be a potential carcinogen in rats.

In a "Preliminary Screening Test" effects on reproduction were not observed (histopathological findings were not documented). A teratology study has not been located. In general, 2NT is more toxic than its 3- and 4- nito isomers. Documented symptoms for humans are headache, flushing of face; dizziness, dyspne, cyanosis, nausea, vomiting, muscular weakness, increased pulse and respiratory rate, irritability and convulsions. 2NT is also a methaemoglobin former apparently of low grade. Target organs for nitrotoluene isomers are identified as the blood, central nervous system, gastrointestinal, cardiovascular system, and skin.

NATURE OF FURTHER WORK RECOMMENDED

Manufacturers should be contacted regarding product stewardship and the preparation of a status report.