

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

August 22, 1995

TO: N-Nitrosodi-n-propylamine file (CAS # 621-64-7)
FROM: Gary Butterfield
SUBJECT: Screening level for N-Nitrosodi-n-propylamine

There is no reported animal toxicity studies of N-nitrosodi-n propylamine having been conducted by the inhalation route of exposure. However, structurally related chemicals, N-nitrosodimethylamine and N-nitrosodiethanolamine, are readily absorbed by the inhalation route of exposure, with absorption rates of 70 to 90%.

Based on oral animal studies, EPA has classified N-nitrosodi-n-propylamine as a class B2 carcinogen (IRIS 1995). IARC also has classified N-nitrosodi-n-propylamine as a class 2B carcinogen. EPA has calculated and listed in IRIS an oral slope factor, but has not calculated an inhalation unit risk for N-nitrosodi-n-propylamine.

Oral exposures in rats, chronic gavage and drinking water consumption, have produced tumors in the liver, nasal cavity and esophagus in rats. In mice, forestomach tumors occurred following oral treatment. The systemic widespread occurrence of tumors can be taken as a sign of the system wide effects of N-nitrosodi-n-propylamine. Based on the system wide tumorogenic effects and the suspected easily absorption via the inhalation route when compared to similar compounds, it would seem reasonable to be able to base the unit risk value on EPA's oral potency of 7 (mg/kg)^{-1} which was derived from Druckery et al (1967), see IRIS. Using this oral potency results in the following screening levels with annual averaging.

$$\text{IRSL} = 10^{-6} / [7 / ((\text{mg/kg}) \times (70\text{kg}/20\text{m}^3) \times (1000\text{ug}/\text{mg}))] = 10^{-6} / 0.002 = 0.0005 \text{ ug}/\text{m}^3$$
$$\text{SRSL} = 10^{-5} / [7 / ((\text{mg/kg}) \times (70\text{kg}/20\text{m}^3) \times (1000\text{ug}/\text{mg}))] = 10^{-5} / 0.002 = 0.005 \text{ ug}/\text{m}^3$$

References:

ATSDR. 1989. Toxicological profile for N-nitrosodi-n-propylamine.
Druckery et al. 1967. Organotropism carcinogenic activities of 65 different N-nitroso compounds in BD-rats. Z. Krebsforsch 69:103-201.

EPA. 1995. IRIS.

IARC. 1978. IARC monographs 11:51-257.