

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for N-Propyl Acetate, CAS# 109-60-4  
FROM: Margaret M. Sadoff, AQD Toxics Unit  
RE: Update of Interim ITSL for N-Propyl Acetate  
DATE: August 16, 2006

A search of the literature and the following databases was performed for information regarding n-propyl acetate: American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (2004), National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Hazardous Chemicals (2005), Integrated Risk Information System (IRIS), Registry of Toxic Effects of Chemical Substances (RTECS), Environmental Protection Bureau Library, International Agency for Research on Cancer (IARC) Monographs, CAS Registry Online, Hazardous Substance Data Bank (HSDB), National Library of Medicine/Toxline, Health Effects Assessment Summary Tables (HEAST), National Toxicology Program (NTP) Study Database, Entrez PubMed, and CalEPA's Toxicity Values Database.

N-propyl acetate was last reviewed in 1993. An interim ITSL of 8,350 ug/m<sup>3</sup> with an 8-hour averaging time was set based on the OEL at the time. No literature search was performed in 1993 to find data from which an RfC-based ITSL could be derived. This update was performed to determine the extent of the data available on n-propyl acetate. Since the database is quite limited and no chronic studies were found, the interim ITSL will be adopted as final.

**The final ITSL for n-propyl acetate is 8,350 ug/m<sup>3</sup>, 8-hour average.**

Chemical Description, Uses & Exposure

(Source: Towline HSDB, RTECs, ChemInfo at inttox.org)

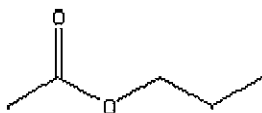
N-propyl acetate is a colorless liquid with a fruity, pear-like odor. It is produced and used as a solvent (especially for nitrocellulose-based inks), flavor additive, and in the manufacture of perfumes. It is also found naturally in many plants and fruits and may be released to the environment as a plant volatile. With a vapor pressure of 35.9mmHg at 25C, this chemical is expected to exist solely as a vapor in ambient air. Estimated atmospheric half-life is about 5 days.

Since it is used as a flavoring agent, FDA classifies n-propyl acetate, like isopropyl acetate, as a Group 3 substance:

"Solvents in Class 3 may be regarded as less toxic and of lower risk to human health. Class 3 includes no solvent known as a human health hazard at levels normally accepted in pharmaceuticals. However, there are no long-term toxicity or carcinogenicity studies for many of the solvents in Class 3. Available data indicate that

they are less toxic in acute or short-term studies and negative in genotoxicity studies. It is considered that amounts of these residual solvents of 50 mg/day or less would be acceptable without justification. This would equate to an inhalation value of 175 mg/m<sup>3</sup>."

Occupational exposure may occur via inhalation or dermal contact whereas the general population is largely exposed through ingestion of food sources that contain n-propyl acetate. Odor thresholds are 0.048 to 0.7 ppm (detection) and 0.14 to 26 ppm (recognition).



MW = 102      1ppm = 4.17 mg/m<sup>3</sup>

#### Animal Toxicity

(Sources: RTECs, HSDB, ACGIH)

The only data found were acute lethality data. One LC<sub>50</sub> of 8,000 ppm was reported from a 4-hour acute exposure in rats (4/6 died). Several LD<sub>50</sub>'s reported in rodents ranged from 1,420 to 9,370 mg/kg. Generally, at concentrations above 200 ppm, propyl acetates are irritating to the nose and larynx. Application of 0.5 ml in rabbits caused mild eye irritation and no skin irritation after 24 hours.

From the acute animal inhalation data, n-propyl acetate appears to be more toxic than isopropyl acetate or ethyl acetate but less toxic than n-butyl acetate. (But, ACGIH lowered the TLV for isopropyl acetate in 2003 to reflect its greater potential for irritancy). The narcotic potential of n-propyl acetate, relative to ethyl acetate, is 1.3.

Higher concentrations can produce headache, dizziness, drowsiness, shortness of breath and other signs of CNS depression. Limiting concentrations for CNS depression over a 5-hour exposure period were 9,000 ppm for cats and 6,000 ppm for mice. In cats exposed to 2600 ppm by inhalation, salivation and eye irritation were observed. N-propyl acetate has not been identified as a skin sensitizer and has very low toxicity by ingestion (Rat LD<sub>50</sub> = 9.8 mg/kg or 8.7 g/kg; rabbit skin LD<sub>50</sub> > 20 ml/kg). This chemical has not been evaluated for carcinogenicity, reproductive/developmental toxicity or genotoxicity but potential is believed to be low due to its relatively low toxicity, in general.

#### Potential for Human Toxicity

NIOSH/OSHA has a 10-hour TWA of 200 ppm (840 mg/m<sup>3</sup>) and a STEL of 250 ppm (1,050 mg/m<sup>3</sup>). The IDLH is listed as 1700 ppm (7,110 mg/m<sup>3</sup>). ACGIH values are identical. Both OELs are set to protect against irritation and are based on analogy to the TLVs for ethyl acetate

(400 ppm) and n-butyl acetate (TWA-150 ppm; SETL-200 ppm). NIOSH has also identified special populations at risk to include employees with chronic respiratory, skin, kidney, or liver disease. Additional support for these thresholds is offered by evidence in experimental animals. For example, the vapors of a closely related chemical, isopropyl acetate, have caused eye irritation in experimental animals upon exposure to 200 ppm for 15 minutes. Although it is readily absorbed via the lungs and GI tract, bioaccumulative potential is believed to be low, based on the study of related acetates, which are metabolized to n-propanol and acetic acid.

#### Update of ITSL

The occupational exposure levels remain the most pertinent data on which to base an ITSL pursuant to Rule 232(1)(c). Only an RfC-based ITSL would supersede an OEL-based ITSL according to AQD toxics rules hierarchy. Therefore, the interim ITSL will be adopted as the final ITSL.

**The final ITSL for n-propyl acetate is 8,350 ug/m<sup>3</sup>, 8-hour average.**

MS:LH