

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

April 7, 1993

TO: File for Ethylene glycol mono-propyl ether file (CAS #2807-30-9)

FROM: Gary Butterfield

SUBJECT: ITSL for ethylene glycol mono-propyl ether

There is no occupational exposure limits established by ACGIH, NIOSH, or OSHA for ethylene glycol mono-propyl ether (or EGPE). This material is also not listed in EPA's IRIS database or BEAST table. RTECS identified a couple of acute studies, listed below. Patty's had a brief evaluation which mostly described older (pre-1960) and foreign acute animal toxicity. A March 25, 1993 CAS-on-line search was conducted for ethylene glycol mono-propyl ether. A few short term inhalation studies were identified. Most of these were associated with investigations into developmental toxicity potential. This endpoint has been more thoroughly investigated because of ethylene glycol and other ethylene glycol ethers known reproductive effects. In the investigations into potential developmental toxicity, pregnant rats (Krasavage and Katz 1985) or rabbits (Krasavage et al 1990) were exposed during gestation to vapors at concentrations of up to 400 ppm for rats and 500 ppm for rabbits. In the rabbit study, Krasavage et al (1990) reported no effects on maternal or fetal parameters even at the highest dose tested (500 ppm). Rats appear to be a more sensitive species than rabbits. Rat maternal toxicity, as well as reduced fetal ossification, was evident at doses of 200 ppm and greater as reported in Krasavage and Katz (1985). A NOAEL of 100 ppm was identified in this study. The observed effects supporting maternal toxicity at doses of 200 ppm and greater was: hemoglobinuria; hematologic changes; and histopathologic changes in the spleen, liver, thymus; and spleen organ weight changes. These changes are consistent with effects observed in the two week rat inhalation study reported by Katz et al (1984). In this two week study a NOAEL of 200 ppm was identified, as exposures to concentrations greater than 200 ppm resulted in hemoglobinuria, changes in hematological parameters (decreased red blood cell counts, and increases in mean corpuscular volume and mean corpuscular hematocrit), increased spleen weight with histopathology changes of congestion, lymphoid hyperplasia, extramedullary hematopoiesis and hemosiderin.

The use of repeated dose inhalation toxicity studies for establishing an ITSL is more preferable than the use of short term or acute LD50's (Katz et al 1984, Smyth et al 1969) or LC50's (Katz et al 1984, Werner et al 1943). The 100 ppm NOAEL, from Krasavage and Katz (1985), is lower than the NOAEL identified from the other toxicity studies that were available (Katz et al 1984, Krasavage et al 1990). Thus the ITSL will be based on the Krasavage and Katz (1985) NOAEL, and calculated as follows.

$$\text{ITSL} = \frac{(100 \text{ ppm} \times 4.26 \text{ mg/m}^3/\text{ppm}) \times 6 \text{ hr}/24}{35 \times 100} = 30 \text{ } \mu\text{g/m}^3$$

with an annual average

Note: Additional research on long term effects of this chemical could have a great impact on this ITSL. From a comparison of this ITSL to the ITSL's for other ethylene glycols, it becomes apparent that this ITSL is much lower in relationship. This can be attributed to the relatively few number of studies conducted with EGPE, and the fact that the available studies have been conducted were for a fairly short duration, and these studies investigated a relatively narrow spectrum of possible end points. Thus, the use of a relatively large uncertainty factor consistent with Rule 232(1)(d) has had a great impact on producing a lower ITSL. Use of this uncertainty factor is considered appropriate to compensate for these data deficiencies, at this time.

References:

Katz et al. 1984. Comparative acute and subchronic toxicity of ethylene glycol mono-propyl ether and ethylene glycol mono-propyl ether acetate. *Environ Health Perspect* 57:165-175.

Krasavage and Katz. 1985. Developmental toxicity of ethylene glycol mono propyl ether in the rat. *Teratology* 32:93-102.

Krasavage et al. 1990. Ethylene glycol mono-propyl ether: a developmental toxicity study in rabbits. *Fund Appl Toxicol* 15:517-527.

Smyth et al. 1969. Range-finding toxicity datas List VII. *Am md Hyg Assoc J* 30:470-476.

Werner et al. 1943. The acute toxicity of vapors of several monoalkyl ethers of ethylene glycol. *J md Hyg Toxicol* 25:157-163. GB: ma