MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

June 1, 2016

TO: Propylene Glycol Monomethyl Ether (CAS No. 1320-67-8)

FROM: Mike Depa, Toxics Unit, Air Quality Division

SUBJECT: Initial Threshold Screening Level

The Initial Threshold Screening Level (ITSL) for propylene glycol monomethyl ether is 2000 µg/m³, with annual averaging time. The ITSL was derived pursuant to Rule 232(1)(a).

The basis of the ITSL for propylene glycol monomethyl ether with CAS No. 1320-67-8 is the same as the basis for the ITSL for propylene glycol monomethyl ether with CAS No. 107-98-2. The CAS numbers are different because one is a mixture of isomers of propylene glycol monomethyl ether and one is for a specific isomer. See attached memo for the explanation of these differences and the rationale for using the same ITSL for both.

U.S. Environmental Protection Agency (EPA, 1991) derived a Reference Concentration (RfC) of 2000 µg/m³ for propylene glycol monomethyl ether (CAS No. 107-98-2) from a rat and rabbit subchronic inhalation study. A no-observed-adverse-effect-level (NOAEL) of 3678 mg/m³ was identified from this study. A lowest-observed-adverse-effect-level (LOAEL) of 11060 mg/m³ based on mild reversible sedation (extrarespiratory effect). Since the b:a lambda value is unknown for humans, a default value of 1.0 is used to convert from animal to human equivalent concentration (HEC).

NOAEL(ADJ) = 3687 mg/m³ x 6 hours/24 hours x 5 days/7 days = 658 mg/m³ = NOAEL(HEC)

The total Uncertainty factor (UF) is 300; the individual UFs used include:

10 for sensitive individuals
10 for use of a subchronic study for a chronic RfC derivation
3 for interspecies extrapolation with default dosimetric adjustment

RfC = NOAEL(HEC)/(Total UF)
RfC = (658 mg/m³)/300 x 1000µg/mg
RfC = 2190 µg/m³; The US EPA rounds to 1 significant figure, therefore the RfC = 2000 µg/m³

Previously, the averaging time (AT) assigned to propylene glycol monomethyl ether was 24 hours, as per the default methodology (see attached memo from Gary Butterfield dated December 22, 1992). The current file review concludes that the AT may appropriately be set at annual, based on the nature and duration of the key study and the ITSL value derivation, as allowed under Rule 229(2)(b). Therefore, the AT is set to annual.

Reference:

EPA (1991). Propylene glycol monomethyl ether (PGME); CASRN 107-98-2. Integrated Risk Information System (IRIS) U.S. Environmental Protection Agency. Chemical Assessment Summary. National Center for Environmental Assessment. Verification Date — 04/25/1991 https://www.epa.gov/iris <Accessed June 1, 2016)

Attachment

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMNUNICATION

December 22, 1992

TO: Propylene Glycol Monomethyl Ether (CAS No. 1320-67-8)

FROM: Gary Butterfield

SUBJECT: ITSL for Propylene Glycol Monomethyl Ether

The CAS number 1320-67-8 is for the unspecified isomer of propylene glycol monomethyl ether, also known as methoxypropanol or PGME. This material exists in two isomeric forms, 1-methoxy-2—propanol (CAS # 107—98—2) and 2—methoxy-1-propanol (CAS # unknown). Johansson (1990) describes how PGME is created for industrial applications, as well as, some of the health effects from exposure. Johansson (1990) describes resultant industrial product as being 95 to 99 % 1-methoxy-2-propanol and only 1 to 5 % of the 2—methoxy—1— propanol isomer. EPA has established an RfC for 1—methoxy—2— propanol of 2000 ug/m3. As the industrial product is expected to be nearly all 1-methoxy-2-propanol, and there is anticipated to be little toxicological impact from the small percentage of 2-methoxy- 1—propanol, it will be considered appropriate to apply the isomer specific RfC to the mixture.

The ITSL for propylene glycol monomethyl ether is then 2000 ug/m3 with a 24-hour averaging time.

References:

EPA. 1992. IRIS database listing for CAS 1 107—98-2.

Johansson, G. 1990. NEG and NIOSH basis for an occupational health standard: propylene glycol ethers and their acetates. DHHS (NIOSH)Pub # 91—103.