

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**

**INTEROFFICE COMMUNICATION**

May 31, 2016

To: File for Methyl Isobutyl Ketone file (CAS # 108-10-1)  
From: Michael Depa, Air Quality Division, Toxics Unit  
Subject: Acute Screening Level with 8-hour Averaging Time

The Initial Threshold Screening Level (ITSL) for methyl isobutyl ketone (MIBK) is 820 µg/m<sup>3</sup> with an 8-hr averaging time.

The American Conference of Governmental and Industrial Hygienists (ACGIH) derived a Threshold Limit Value – Time Weighted Average (TLV-TWA) for MIBK at 20 ppm (82 mg/m<sup>3</sup>) to protect against central nervous system (CNS) effects in occupational settings (ACGIH, 2010). ACGIH (2010) also derived a Threshold Limit Value – Short-term Exposure Limit (TLV-STEL) of 75 ppm (3100 mg/m<sup>3</sup>).

ACGIH (2010) summarized several human studies used to derive the TLV. One study found that at 200 mg/m<sup>3</sup> (49 ppm) for two hours there was a statistical elevation in intensity of CNS symptoms as reported on the 17-item questionnaire.

In another study reported by ACGIH (2010), more than two-thirds of 19 workers were exposed to MIBK in a room with a centrifuge for 20 to 30 minutes per day. The concentration of MIBK was 500 ppm (2048 mg/m<sup>3</sup>) near the centrifuge, whereas others in the room were exposed to 80 ppm (327 mg/m<sup>3</sup>). Clinical chemistry results from all the workers were within the normal range. ACGIH (2010) reported that more than half of 19 workers involved complained of weakness, loss of appetite, headache, burning of the eyes, stomach ache, nausea, and vomiting. Four were said to have slightly enlarged livers and six complained of nonspecific colitis. A follow-up study conducted five years later identified air concentration of MIBK of 100 to 105 ppm in the vicinity of the centrifuge and 50 ppm elsewhere in the room during the operation of the centrifuge. Only one of the 14 original workers reported eye irritation at the five year follow-up interview. A few workers still complained of gastrointestinal and CNS disturbances. Slight liver enlargement persisted in two workers, but other earlier symptoms had been reduced to the point of disappearing.

Pursuant to Rule 230(1)(c) the ITSL is calculated as follows:  $ITSL = OEL/100$

$$ITSL = 82 \text{ mg/m}^3/100 \times 1000\mu\text{g/mg} = 820 \text{ }\mu\text{g/m}^3$$

Where the OEL is the occupational exposure limit, in this case the OEL is the ACGIH TLV-TWA.

**Reference**

ACGIH 2010. Methyl Isobutyl Ketone. Documentation of the Threshold Limit Values and Biological Exposure Indices, 7th Edition. Cincinnati, OH.