

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for Bromobenzene (CAS# 108-86-1)

FROM: Doreen Lehner, Toxics Unit, Air Quality Division

DATE: January 27, 2017

SUBJECT: Bromobenzene (CAS# 108-86-1) ITSL change in the averaging time from 24 hours to annual

The initial threshold screening level (ITSL) for bromobenzene is $60 \mu\text{g}/\text{m}^3$ based on an annual averaging time. The ITSL was originally established on 3/31/2010 and was set at $60 \mu\text{g}/\text{m}^3$ based a 24-hour averaging time. The ITSL is based on an EPA (2009) reference concentration (RfC) of $60 \mu\text{g}/\text{m}^3$ derived from an NTP (1985) 13-week inhalation study on mice. Groups of 10 male and female F344/N rats and B6C3F₁ mice were exposed to bromobenzene vapors through whole- body exposure at 0, 10, 30, 100, or 300 ppm (0, 64.2, 192.6, 642, or 1926 mg/m^3) for 6 hours/day, 5 days/week for 13 weeks (the mouse study did not include the 300 ppm males). The liver was the most sensitive target; liver weights were significantly increased for the two highest doses in both sexes of rats. In mice, the absolute liver weights increase in female mice at concentrations of 30 ppm and above. The liver to body weight ratio was significantly increased in male mice in the 100 ppm dose group (the study didn't include a 300 ppm male mouse dose group). The liver to body weight ratio was significantly increased in female mice at all dose groups. A significant increase in cytomegaly was observed in female mice at the 300 ppm dose. EPA performed Benchmark Dose modeling on the most critical effect of hepatocellular cytomegaly in female B6C3F₁ mice which gave a point of departure (POD) of 55 ppm (human equivalent POD of $63 \text{mg}/\text{m}^3$). EPA determined the chronic inhalation RfC of $60 \mu\text{g}/\text{m}^3$. The current file review concludes that the averaging time may appropriately be set at annual, as the key study is a 13-week inhalation study. Therefore, the averaging time is being changed from 24 hours to annual.

References:

Act 451 of 1994, Natural Resources and Environmental Protection Act and Air Pollution Control Rules, Michigan Department of Environmental Quality.

EPA. 2009. Integrated Risk Information System. Bromobenzene; CASRN 108-86-1.
Available online at:
https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1020

NTP. 1985. Subchronic inhalation study of bromobenzene in mice. National Institutes of Health, National Toxicology Program, Research Triangle Park, NC. November, 1985.
Unpublished study.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

INTEROFFICE COMMUNICATION

TO: Bromobenzene File (CAS # 108-86-1)
FROM: Gary Butterfield
SUBJECT: Screening Level for Bromobenzene
DATE: March 31, 2010

The ITSL for bromobenzene is being set to match the September 2009 EPA chronic RfC at 60 ug/m³ with 24 hour averaging. The RfC is based on NTP 1985 13-week gavage study in rats and mice. The mice hepatocellular cytomegaly was the critical adverse effect. The BMDS methods were followed by EPA. See the IRIS documentation for further details.