

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for p-toluenesulfonic acid (CAS# 104-15-4)

FROM: Keisha Williams, Air Quality Division (AQD)

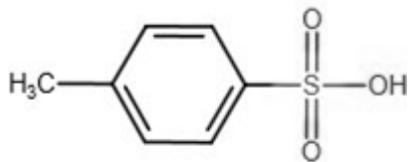
DATE: November 4, 2016

SUBJECT: Screening level update for p-toluenesulfonic acid

The initial threshold screening levels (ITSLs) for p-toluenesulfonic acid are $1.8 \mu\text{g}/\text{m}^3$, annual averaging time and $210 \mu\text{g}/\text{m}^3$, 1 hour averaging time.

There is a lack of information regarding the inhalation toxicity of p-toluenesulfonic acid (Figure 1). However, High Production Volume (HPV) Assessment Reports on p-toluenesulfonic acid and the similar compound, benzenesulphonic acid, noted that portal of entry (POE) effects are suspected as “both substances are sulphonic acids, which are very acidic (comparable to sulphuric acid) and therefore expected to show local effects in the gastrointestinal tract” (NOTOX, 2004; NOTOX, 2007). Since POE effects are expected, it is not appropriate to use toxicity information from oral studies to derive an ITSL. Although there is a lack of inhalation toxicity information, sulfuric acid toxicity data will be used to derive ITSLs in an effort to be health protective.

Figure 1. p-toluene sulfonic acid



In the AQD Toxic Air Contaminant list, sulfuric acid has two ITSLs: $1 \mu\text{g}/\text{m}^3$, annual averaging time based on a monkey study where bronchial epithelial hyperplasia and bronchiolar wall thickening were seen in a dose-dependent fashion after 78 weeks of inhalation exposure and $120 \mu\text{g}/\text{m}^3$, 1 hour averaging time based on a human, clinical study where changes in airway function was seen in asthmatics in a dose-dependent fashion (MDEQ, 2015).

With molecular weight adjustment considerations, as shown in Equation 1, the resulting ITSLs for p-toluenesulfonic acid are $1.8 \mu\text{g}/\text{m}^3$, annual averaging time and $210 \mu\text{g}/\text{m}^3$, 1 hour averaging time.

Equation 1.

$$\frac{ITSL_{sulfuric\ acid}}{molecular\ weight_{sulfuric\ acid}} = \frac{ITSL_{p-toluenesulfonic\ acid}}{molecular\ weight_{p-toluenesulfonic\ acid}}$$

where molecular weight for sulfuric acid is 98.1 g/mol

molecular weight for p-toluenesulfonic acid is 172.198 g/mol

ITSLs for sulfuric acid are $1\ \mu\text{g}/\text{m}^3$, annual averaging time and $120\ \mu\text{g}/\text{m}^3$, 1 hour averaging time

$$ITSL_{p-toluenesulfonic\ acid} = \frac{1\ \frac{\mu\text{g}}{\text{m}^3}}{98.1\ \text{g/mol}} \times 172.198\ \frac{\text{g}}{\text{mol}} \approx 1.8\ \frac{\mu\text{g}}{\text{m}^3}, \text{ annual averaging time}$$

$$ITSL_{p-toluenesulfonic\ acid} = \frac{120\ \frac{\mu\text{g}}{\text{m}^3}}{98.1\ \text{g/mol}} \times 172.198\ \frac{\text{g}}{\text{mol}} = 210.64\ \frac{\mu\text{g}}{\text{m}^3} \\ \approx 210\ \frac{\mu\text{g}}{\text{m}^3}, 1\ \text{hour averaging time}$$

References

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

MDEQ. 2015. *Memo from Michael Depa to Files for Sulfur Trioxide (SO₃) [CAS# 7446-11-9], Sulfuric Acid (H₂SO₄) [CAS# 7664-93-9], and Oleum [CAS# 8014-95-7].* January 7, 2015. Michigan Department of Environmental Quality, Air Quality Division.

NOTOX. 2004. High Production Volume (HPV) Challenge Program: HPV Assessment Report on Benzenesulphonic acid (CAS# 98-11-3).

NOTOX. 2007. High Production Volume (HPV) Challenge Program: HPV Assessment Report on p-Toluenesulphonic acid (CAS# 104-15-4). Accessed July 21, 2016.

https://iaspub.epa.gov/opptppv/document_api.download?FILE=c16597rs.pdf

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

November 10, 1998

TO: File for p-toluenesulfonic acid (CAS# 104-15-4)
FROM: Cathy Simon, Supervisor, Toxics Unit, Air Quality Division
SUBJECT: Change in the Initial Threshold Screening Level (ITSL)

The ITSL for p-toluenesulfonic acid has been changed from 0.04 $\mu\text{g}/\text{m}^3$ to 0.1 $\mu\text{g}/\text{m}^3$ based on annual averaging time.

The change in the ITSL was made due to a revision in the State's air toxic rules which became effective on November 10, 1998. Previously, the ITSL had been set pursuant to Rule 232(i). This rule sets the ITSL at a default value of 0.04 $\mu\text{g}/\text{m}^3$ (annual average) when no specific data are available to determine an ITSL. The November 10, 1998 revisions to the rules changed this default ITSL to a value of 0.1 $\mu\text{g}/\text{m}^3$.

No updated review of the literature has been done since the ITSL was originally set at a value of 0.04 $\mu\text{g}/\text{m}^3$, to determine if new data are available for this compound.

CAS: SLB

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

March 12, 1993

TO: Lynn Fiedler

FROM: Cathy Simon

SUBJECT: Studio 5 Wood Finishes - Permit No. 870-92

The ITSL for 4-methylbenzene sulfuric acid (CAS No. 104-15-4) is $0.04 \mu\text{g}/\text{m}^3$, based on an annual averaging time.

CAS : ma