

MICHIGAN DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT

INTEROFFICE COMMUNICATION

TO: File for Adipic Acid (CAS # 124-04-9)

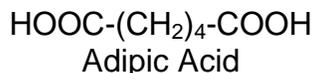
FROM: Doreen Lehner, Toxics Unit, Air Quality Division

DATE: July 12, 2010

SUBJECT: Screening Level for Adipic Acid (CAS # 124-04-9)

The initial threshold screening level (ITSL) for adipic acid is 50 ug/m³ based on an 8-hour averaging time.

Adipic acid (CAS # 124-04-9) also known as hexanedioic acid or 1,4-butanedicarboxylic acid is a white, crystalline solid. It is used in the manufacture of nylon-6,6, a polymer used in the production of synthetic fibers. Adipic acid is also used in the production of plasticizers, resins, plastics, foams, synthetic lubricants, and is also used as a food acidulant in gelatin desserts, powdered concentrates for fruit-flavored beverages, bottled beverages, jams and jellies, canned vegetables, candies, flavoring extracts and baking powder (Kirk-Othmer, 1978).



A literature review was conducted to determine an initial threshold screening level (ITSL) for adipic acid. The following references and databases were searched to derive the above screening level: EPBCCD, United States Environmental Protection Agency (US EPA) Integrated Risk Information System (IRIS), National Institute for Occupational Safety and Health (NIOSH), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values and Biological Exposure Indices (TLV/BEI) 2008 guide, National Toxicology Program (NTP) Study Database, International Agency for Research on Cancer (IARC), Acute Database, Chemical Abstract Service (CAS) Online, National Library of Medicine (NLM)-online, EPA Aggregated Computational Toxicology Resource (ACToR) Database, EPA Toxic Substance Control Act Test Submission Database (TSCATS) and Kirk-Othmer chemical encyclopedia. RfC or RfD values were unavailable. There is a NIOSH recommended exposure limit data available which is based on a threshold limit value from ACGIH. The recommended TLV is 5 mg/m³ as a time-weighted average (TWA) of a conventional 8-hour workday. Based on Rule 232 (1) (c) the ITSL is determined as follows:

$$ITSL = \frac{\text{Occupational ... Exposure ... Level}}{100}$$

Where the occupation exposure level is the TLV of $5 \text{ mg/m}^3 = 5,000 \text{ }\mu\text{g/m}^3$. Using the above equation:

$$\text{ITSL} = \frac{5,000 \text{ }\mu\text{g/m}^3}{100} = 50 \text{ }\mu\text{g/m}^3$$

Based on Rule 232 (2) (a) the averaging time for this ITSL is 8 hours.

Based on the above data, the ITSL for adipic acid is $50 \text{ }\mu\text{g/m}^3$ based on an 8- hour averaging time.

References:

ACGIH. 2008. TLVs and BEIs Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices. ACGIH Worldwide Signature Publications.

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

Kirk-Othermer. 1978. Encyclopedia of Chemical Technology 3rd Edition Vol 1. Edited by Mark HF, Othmer DF, Overberger CG, Seaborg GT, Grayson M, and Eckroth D. John Wiley & Sons, New York. ISBN 0-471-02037-0. pp 510-531.

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