

ACETAMIDE

Acetamide is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 60-35-5

$\text{CH}_3\text{C}(\text{O})\text{NH}_2$

Molecular Formula: $\text{C}_2\text{H}_5\text{NO}$

Acetamide is a colorless, deliquescent hexagonal crystal. It is odorless when pure, but frequently has a mousy odor (Merck, 1983). It is soluble in water, alcohol, chloroform, glycerol, hot benzene, and slightly soluble in ether (Sax, 1987). One gram of acetamide dissolves in 0.5 milliliter of water, two milliliters of alcohol, and six milliliters of pyridine. Acetamide is combustible and when heated to decomposition, it emits toxic fumes of oxides of nitrogen (Sax, 1989; Merck, 1983).

Physical Properties of Acetamide

Synonyms: acetic acid amide; acetimidic acid; ethanamide; methanecarboxamide

Molecular Weight:	59.07
Boiling Point:	222 °C
Melting Point:	81 °C
Density/Specific Gravity:	1.159 at 20/4 °C
Vapor Pressure:	10 mm Hg at 105 °C
Log Octanol/Water Partition Coefficient:	-1.26
Henry's Law Constant:	5.52×10^{-9} atm m ³ /mol
Conversion Factor:	1 ppm = 2.41 mg/m ³

(Merck, 1983; Sax, 1989; HSDB, 1993; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

Acetamide is used in organic synthesis as a reactant, a solvent, and a peroxide stabilizer. It is also used as a general solvent, a hygroscopic agent, wetting agent, penetrating agent, in lacquers, in explosives, in soldering flux, as a solubilizer, and a plasticizer (HSDB, 1993; Sax, 1987).

Acetamide is also used in the manufacture of methylamine and the denaturing of alcohol (Merck, 1983). The primary stationary sources that have reported emissions of acetamide in California are educational institutions and hospitals (ARB, 1997b).

B. Emissions

The total emissions of acetamide from stationary sources in California are estimated to be at least 7 pounds per year, based on data reported under the Air Toxics “Hot Spots” Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of acetamide was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data on ambient concentrations of acetamide are available.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of acetamide was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

In the atmosphere, acetamide is an aerosol and will be subjected to gravitational settling and washout by rain (HSDB, 1993). The atmospheric lifetime is estimated to be less than one day (Kelly et. al., 1994).

AB 2588 RISK ASSESSMENT INFORMATION

The Office of Environmental Health Hazard Assessment reviews risk assessments submitted under the Air Toxics “Hot Spots” Program (AB 2588). Acetamide was not listed in any of the risk assessments reviewed in 1996 (OEHHA, 1996a,b).

HEALTH EFFECTS

Probable routes of human exposure to acetamide are inhalation of vapors or dusts and dermal contact (HSDB, 1993).

Non-Cancer: Human exposure to acetamide may cause mild skin irritation which disappears after exposure stops (HSDB, 1993).

The United States Environmental Protection Agency (U.S. EPA) has the Reference Concentration (RfC) under review, and has not established an oral Reference Dose (RfD) for acetamide (U.S. EPA, 1994a).

No information is available on adverse reproductive or developmental effects of acetamide in humans. No significant adverse reproductive or developmental effects have been reported in test animals exposed to acetamide (U.S. EPA, 1994a).

Cancer: Liver tumors were reported to occur in test animals following oral exposure to acetamide. No information is available on the carcinogenic effects of acetamide in humans. The U.S. EPA has not classified acetamide for carcinogenicity (U.S. EPA, 1994a). The International Agency for Research on Cancer has placed acetamide in Group 2B: Possible human carcinogen (IARC, 1987a).

The State of California, under Proposition 65, has determined that acetamide is a carcinogen (CCR, 1996). The inhalation potency factor that has been used as a basis for regulatory action in California is 2.0×10^{-5} (microgram per cubic meter)⁻¹ (OEHHA, 1994). In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 microgram per cubic meter of acetamide is estimated to be no greater than 20 in 1 million. The oral potency factor that has been used as a basis for regulatory action in California is 7.0×10^{-2} (milligram per kilogram per day)⁻¹ (OEHHA, 1994).

