Product Safety Assessment

Aminomethyl propanediol

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Names
- CAS No. 115-69-5
- Aminomethyl propanediol
- AMPD™ Crystals
- AMPD™ Ultra PC Neutralizing Amine
- AMPD™ amino alcohol products
- 2-Amino-2-methylpropane-1,3-diol
- 1,3-Dihydroxy-2-methyl-2-propylamine
- 2-Amino-2-methyl-1,3-propanediol
- 1,3-Propanediol, 2-amino-2-methyl-

Product Overview

- ANGUS Chemical Company, a subsidiary of The Dow Chemical Company, manufactures and markets aminomethyl propanediol products under the trade name AMPD™ amino alcohol. AMPD products are sold in the form of solid white crystals with a slight amine odor. Two grades are available: AMPD Crystals, and AMPD Ultra PC Neutralizing Amine.¹ For further details, see Product Description.
- AMPD Ultra PC Neutralizing Amine is exclusively used in cosmetics, two-stage hair dyes, and many other personal care applications. This product complies with the European Union (EC) Cosmetics Regulation 1223/2009, a recast of the Cosmetics Directive 76/768/EEC and Amendments, as well as the 2008 ASEAN Cosmetics Directive. AMPD™ Crystals are also used primarily in cosmetics,²³ but are used in other regions and applications where specific EU and ASEAN requirements are not necessary. For further details, see Product Uses.
- Good housekeeping and dust control are necessary for safe handling of this material. Each manufacturing or formulating facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit unnecessary exposure. For further details, see Exposure Potential.
- Crystals of aminomethyl propanediol may cause severe eye irritation or corneal injury. Prolonged or repeated skin contact may result in severe irritation with local redness and discomfort, but is unlikely to result in absorption of harmful amounts. Inhalation of dust may cause irritation to the nose and throat. Aminomethyl propanediol has low toxicity if swallowed. However, swallowing may result in irritation or burns to the mouth, throat, and gastrointestinal tract. At concentrations typical of finished products (<2%), aminomethyl propanediol is

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considered to have very low potential for toxicity.\textsuperscript{1,2} Independent scientific reviews by The Cosmetic Ingredient Review Expert Panel have concluded that aminomethyl propanediol is safe for use in cosmetic products in the applications and at the concentrations specified in the reports, which are typical of commercially used formulations.\textsuperscript{4,5} For further details, see Health Information.

- Aminomethyl propanediol is ultimately biodegradable, unlikely to accumulate in the food chain, and is practically non-toxic to fish. For further details, see Environmental Information.
- AMPD™ amino alcohol products are stable under recommended storage conditions. Avoid exposure to moisture as these materials are hygroscopic (absorb moisture from the air or atmosphere). AMPD products should be stored in a cool, dry location.\textsuperscript{1} For further details, see Physical Hazard Information.

Manufacture of Product

- **Production** – ANGUS Chemical Company, a subsidiary of The Dow Chemical Company, produces AMPD products at manufacturing facilities in Germany and the USA.

Product Description\textsuperscript{1,3}

AMPD™ amino alcohol products are members of a series of products derived from primary alkanolamines. ANGUS Chemical Company produces alkanolamines using nitroparaffin chemistry. Two grades are available: AMPD Crystals and AMPD Ultra PC Neutralizing Amine. AMPD amino alcohol products are sold in the form of solid white crystals with a slight amine odor. The properties of AMPD amino alcohol products (excellent water and alcohol solubility, low toxicity, low odor, color stability) make them suitable for use in cosmetic products.

Product Uses\textsuperscript{2,3}

AMPD™ amino alcohol products are efficient neutralizing agents used primarily in cosmetic and personal-care products. They are useful as mild alkalinity sources in two-stage hair dyes. Specifically, AMPD™ Ultra PC Neutralizing Amine is an ideal choice for use in:

- Cosmetic creams and lotions
- Hair fixatives
- Hair dyes
- Hypoallergenic cosmetic products
- Eye-area cosmetics

Exposure Potential\textsuperscript{1}

AMPD™ amino alcohol products are used for cosmetic and personal care products. Based on the uses for aminomethyl propanediol, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in an aminomethyl propanediol manufacturing facility or in the various industrial or manufacturing facilities that use this material. Those working with this material in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. When prolonged or frequently repeated contact could occur, workers should wear protective clothing chemically resistant to

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this material and chemical goggles. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Avoid generating and breathing dust. Good housekeeping and dust control are necessary for safe handling of this material. Each manufacturing or formulating facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit unnecessary exposure. See Health Information.

- **Consumer exposure to products containing AMPD™ amino alcohol products** – AMPD amino alcohol products are not sold directly to consumers, but they are used at low levels in cosmetics and personal care products. After reviewing toxicology information, independent experts have concluded that aminomethyl propanediol is safe to use in low concentrations, like those currently used for cosmetic and personal care formulations.\(^4,5\) See Health Information.

- **Environmental releases** – Aminomethyl propanediol may be released at low levels into the wastewater treatment system from cosmetic and personal care applications. Since the compound is ultimately biodegradable, it will be removed in biological wastewater treatment plants. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Respiratory protection should be worn when there is the potential to exceed exposure limits. Eliminate all sources of ignition immediately. This material is considered practically nontoxic to fish on an acute basis. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Eliminate all sources of ignition immediately. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Deny unnecessary entry into the area. Keep people away. Use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam to fight the fire. Firefighters should wear positive pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask and protective firefighting clothing. If the material is molten, do not apply direct water stream. Use of a direct water stream may spread the fire. During a fire, smoke may contain the original material in addition to combustion products that may be toxic and/or irritating. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

**Health Information**\(^1,2,3\)

**Eye and skin contact** – Aminomethyl propanediol may cause severe eye irritation or corneal injury. Prolonged or frequently repeated contact with skin, especially moist skin, may result in severe irritation with local redness and discomfort, but is unlikely to result in absorption of harmful amounts.

**Inhalation** – Exposure to vapor is minimal due to low volatility. Inhalation of dust may cause irritation to the upper respiratory tract (nose and throat).

**Ingestion** – Aminomethyl propanediol has low toxicity if swallowed. However, swallowing may result in irritation or burns to the mouth, throat, and gastrointestinal tract. At concentrations typically found in finished products (<2%), aminomethyl propanediol is considered to have low potential for toxicity. Independent scientific reviews by The Cosmetic Ingredient Review Expert Panel have concluded that aminomethyl propanediol is safe for use in cosmetic products in the applications and at the concentrations specified in the reports, which are typical of commercially used formulations.\(^4,5\)

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Genotoxicity – Aminomethyl propanediol was not mutagenic in a bacterial mutation assay (Ames assay) with and without metabolic activation.

Skin sensitizing potential – Structurally similar substances (aminoethyl propanediol) were negative for skin sensitizing potential in assays conducted using guinea pigs. Therefore it is considered unlikely that aminomethyl propanediol would be a skin sensitizer.

For more information, see the relevant Safety Data Sheet.

Environmental Information

Environmental Information 1, 2
Aminomethyl propanediol has very low volatility, and may evaporate slowly from products containing it. Because it is very soluble in water, once introduced, it has a tendency to remain in water.

Aminomethyl propanediol is unlikely to persist in the environment. Aminomethyl propanediol is ultimately biodegradable, which suggests the chemical will be removed from water and soil environments, including biological wastewater treatment plants.

Aminomethyl propanediol is not likely to accumulate in the food chain (bioconcentration potential is low) and is practically nontoxic to fish on an acute basis.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

Physical Hazard Information 1, 3
AMPD™ amino alcohol products are stable under recommended storage conditions. Although hazardous polymerization will not occur, exposure to elevated temperatures can cause these materials to decompose. Decomposition products depend upon temperature, air supply, and the presence of other materials. Avoid exposure to moisture, as these products are hygroscopic.

Avoid contact with metals such as copper and its alloys, zinc and galvanized metals, and aluminum, as well as strong acids or oxidizers. Avoid unintentional contact with halogenated hydrocarbons.

Keep containers closed when not in actual use, as amine-functional products absorb carbon dioxide from the atmosphere. Product should be stored in a cool, dry location.

For more information, see the relevant Safety Data Sheet.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of AMPD™ amino alcohol products. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, or Contact Us.

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Additional Information

- Safety Data Sheet (http://www.dow.com/angus/prod/literature.htm)
- Contact Us (http://www.dow.com/angus/contact)
- *AMPD™ (Amino Alcohol) Technical Data Sheet*, ANGUS Chemical Company, a subsidiary of The Dow Chemical Company, TDS 10E, Form No. 319-00018-JAL, 2000 (request from http://www.dow.com/angus/contact)

For more business information about, visit the ANGUS Products, Applications & Chemistry web site at (http://www.dow.com/angus/prod).

References

1. *AMPD™ Crystals Material Safety Data Sheet*, ANGUS Chemical Company, a subsidiary of The Dow Chemical Company
3. *AMPD™ Technical Data Sheet*, ANGUS Chemical Company, a subsidiary of The Dow Chemical Company, TDS 10E, Form No. 319-00018-JAL

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