

Product Safety Summary

Aniline

This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the Summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the Material Safety Data Sheet (MSDS) for the chemical substance.

Chemical Identity

Abbreviation :	none used
CAS Number :	62-53-3
Common Names :	Aminobenzene Aniline oil Phenylamine Blue oil

Product Overview

- Pure aniline is a highly poisonous, oily, colorless liquid with a somewhat unpleasant odor of rotten fish and also has a burning aromatic taste.
- Aniline is of great importance in the dye industry, being used as the starting substance in the manufacture of many dyes-e.g., indigo-and as an aid in the manufacture of others. It is also used to make chemicals used in producing rubber, urethane foams, explosives, herbicides and fungicides. Aniline is prepared commercially by the reduction of nitrobenzene, a product of coal tar, or by heating chlorobenzene with ammonia in the presence of a copper catalyst.
- May be fatal if swallowed, inhaled or absorbed through skin. Causes irritation to the skin, eyes and respiratory tract. Combustible liquid and vapor. May cause methemoglobinemia. Affects blood, cardiovascular system, central nervous system, liver and kidneys.
- Airborne limits have been established for aniline in the work environment. The American Conference of Governmental Hygienist (ACGIH) has a threshold limit value (TLV) of 5 ppm for an eight hour time weighted average basis with a skin notation. The Occupational Health and Safety Administration (OSHA) has established a permissible exposure limit (PEL) of 2 ppm for an eight hour time weighted average basis with a skin notation, also.
- For further safety and health information, the current Material Safety Data Sheet (MSDS) should be used for this substance.

Physical/Chemical Properties

- Aniline is a clear, colorless oily liquid which darkens on exposure to light or air. It has a strongly amine or fish like odor.

- The specific gravity of aniline is 1.02 and is denser than water. Aniline is slightly soluble in water 3.5 grams / 100 grams of water.
- The boiling point of aniline is 184C and the freezing point is approximately -6C. The flash point of aniline is 70C, by the Tag Closed cup method.

Health Information

Aniline is a potentially hazardous material. A thorough knowledge of potential dangers, with strict adherence to recommended safety practices, is essential before aniline products are handled, stored or used. Workers must be properly instructed and supervised in the handling of aniline. Limits have been established for allowable concentrations in the work environment. ACGIH has a threshold limit value (TLV) of 2 ppm for an eight hour time-weighted average basis with a skin notation, while OSHA has set a permissible exposure limit (PEL) of 5 ppm for an eight hour time-weighted average basis with a skin notation, also.

Effects on the Respiratory System:

Exposures to mists or vapor at levels above the recommended exposure limits can produce eye, nose or lung irritation. Symptoms may include bluish discoloration of lips and tongue, severe headache, nausea, confusion, dizziness, shock, respiratory paralysis, death. Aniline affects the ability of the blood to carry oxygen.

Effects on the Skin:

Aniline may be absorbed through the skin. Symptoms of skin absorption parallel those from inhalation exposure. May cause skin irritation and local contact may cause dermatitis.

Effects on the Eyes:

Aniline vapor is an eye irritant. May cause tearing and blurred vision. Splashes may cause corneal damage.

Effects of Ingestion:

Aniline is toxic. Lethal doses may be as little as one gram. Symptoms of ingestion parallel those of inhalation exposure.

Chronic Hazards:

Aniline is a blood toxin, causing hemoglobin to convert to methemoglobin, resulting in cyanosis. Lengthy or repeated exposures may result in decreased appetite, anemia, weight loss, nervous system affects, and kidney, liver and bone marrow damage. Any exposure may cause an allergic skin reaction.

Environmental Information

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material may leach into the groundwater but may evaporate to a moderate extent. When released into the water, this material is expected to readily biodegrade and have a half life between 10 and 30 days. Aniline has been experimentally-determined bio-concentration factor (BCF) of less than 100. It is not expected to significantly bioaccumulate. When released into the air, aniline is expected to readily degrade by reaction with photochemically produced hydroxyl radicals and expected to degrade by photolysis. The half life of aniline in air is less than one day.

Aniline is expected to be very toxic to terrestrial and aquatic life. The LC50/96 hour values for fish are between 10 and 100 mg/l. The EC50/48 hour values for daphnia are less than 1 mg/l. The

inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

A variety of federal, state and local regulations govern the release of any material to the land, air or surface waters. Any release or discharge of aniline must be evaluated in reference to these regulations to determine appropriate response actions and reporting requirements. Aniline is one of the chemicals for which releases to all environmental media must be annually reported.

A regulation called Resource Conservation and Recovery Act (RCRA) must be followed if a volume of aniline or material contaminated with aniline is to be disposed of or discarded. Based on RCRA criteria, aniline or materials contaminated with aniline will likely be considered a "Hazardous Waste" upon disposal and will need to follow certain storage, handling and disposal restrictions as outlined in RCRA. Strict adherence to these restrictions as well as proper characterization and labeling of the material is the responsibility of the generator and handler of the waste material.

Emphasis should be placed on the prevention of releases through careful design of equipment and sound operating procedures. If acrylic acid is lost from containment through a leak or spill, care should be taken to use the proper personal protective equipment, decontamination procedures and other safety considerations. It is important to remember that spills of aniline and materials contaminated by aniline must be handled as RCRA hazardous wastes.

Any release of aniline greater than the "reportable quantity" designated by the EPA in CERCLA or SARA should be reported immediately on discovery to the National Response Center and State Emergency Response Agency (see current MSDS for reportable quantity and pertinent phone numbers).

In the event of accidental spillage of aniline to surface waters or to a municipal water system, contact the local and state pollution control agencies immediately.

Additional Hazard Information

Protect containers against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles, such as strong acids and strong oxidizers, solutions of iron, zinc, aluminum and alkalis. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be no smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Protect from freezing. Containers may be hazardous when empty since they retain product residues (vapors/liquids); observe all warnings and precaution listed for aniline.

Exposure Potential

Although potential for exposure does exist during aniline manufacture, transportation and use, enclosed systems limit the exposure to worker populations and nearby communities. Exposure to the general public may occur in accidental situations. Aniline is not intended for the general use by the general public.

Aniline vapor has a very strong fish like odor that allows for early detection of any potential release. Aniline should only be handled by knowledgeable, well-trained personnel who thoroughly understand the hazards associated with the transportation, storage and use of the chemical.

Workplace exposure should be limited by the use of engineering controls. Aniline vapors must be monitored and controlled below applicable regulatory limits. Aniline should be processed within a closed system. Worker exposure can potentially happen from leaks in piping system, during repair or replacement of the piping system or during removal of a sample for quality control purposes.

Regulations involving hazardous chemicals are continually evolving and thus exposure guidelines are reviewed regularly and modified whenever new information dictates a change. It is important that all companies handling aniline are aware of the current legislative requirements.

The guidelines established by OSHA, ACGIH, NIOSH and others, represent current thinking and are believed to be conservative and protective of occupational workers. There is not guarantee of absolute safety.

Risk Management

The potential hazards associated with aniline can be avoided if workers are adequately instructed in supervised on the proper procedures of handling aniline.

Personal protective equipment (PPE) should be selected based on the potential for exposure to particular chemical(s), and the unique properties of that chemical. In general, PPE is not an adequate substitute for appropriate workplace controls (such as ventilation), or other safe work practices. There may be situations when the only practical means of preventing employee exposure is through the effective use of PPE. When PPE is provided to employees, they must be trained in how, where, when, and why the equipment should be used. The facility must also have provisions for decontaminating and replacing such equipment as necessary.

Eye protection in the form of chemical splash goggles should be worn to prevent aniline from accidentally splashing in an employee's eye. Goggles should be non-vented, and designed specifically to protect against chemical splash. If an employee wears corrective lenses, chemical goggles should be worn over the lenses. Contact lenses are not recommended for use in areas where there is a potential for exposure to aniline. Corrosive vapors can collect behind contact lenses and may cause severe damage to the eye and/or cause the contact lenses to adhere to the eyes.

Skin protection may be found in many forms. Hand protection such as chemical resistant gloves, protective arm sleeves, aprons, full body coveralls, boots, and head coverings are among the types available. Skin protection must be made of a material impervious to aniline. Personal protective equipment should be selected on the basis of potential exposure, e.g., gloves may be required for sample collection while full body clothing including gloves, boot covers, head covering may be necessary for spill clean-up. Skin protection for the purpose of preventing chemical exposure may be worn in conjunction with other types of PPE. For example, steel toe safety shoes may be required to prevent a person's foot from being crushed, but an additional boot cover may be required to prevent aniline permeation into the safety shoe. Skin protection PPE is available in a variety of sizes, and should be available in a size that fits the employee wearing it. Improperly sized PPE may compromise its effectiveness and create additional safety hazards. When skin protection PPE is used, there must be a means of cleaning or disposal/replacement of the PPE.

Respiratory protection is available in two basic varieties, air purifying, and air supplied. In general, air purifying respirators provide less protection than air supplied respirators. Both types, however, have their particular advantages and limitations. The appropriate type of respirator must be selected to provide the appropriate level of protection for the anticipated

degree of exposure to airborne aniline (vapor or mist). Detailed guidance for the selection of respiratory protection can be found in The American National Standards Institute Document Z88.2. Respiratory protective equipment should be approved by NIOSH. It must be carefully maintained, inspected, and cleaned. All employees required to wear respiratory protection must be medically cleared to do so (this ensures their physical capability to wear a respirator) and trained to use and care for the equipment. OSHA requirements for respiratory protection can be found in 29 CFR 1910.134.

Properly designed emergency showers and eyewash fountains should be placed in convenient locations wherever acrylic acid is used. All employees should know the location and operation of this equipment. All equipment must be frequently inspected to make sure they are in proper working condition.

Federal/Science Findings (optional)

U.S. Environmental Protection Agency – Integrated Risk Information System (IRIS)

<http://www.epa.gov/ncea/iris/subst/0350.htm>

U.S. Environmental Protection Agency

<http://www.epa.gov/ttn/atw/hlthef/aniline.html>

U.S Department of Labor – Occupational Safety and Health Administration (OSHA)

http://www.osha.gov/dts/chemicalsampling/data/CH_218800.html

American Conference of Governmental Industrial Hygienists (ACGIH)

<http://www.acgih.org>

Contact Information

<http://www.basf.com>

MSDS

http://worldaccount.basf.com/wa/PublicMSDS~en_US/Search

References

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