

Material Safety Data Sheet  
Aniline

Section 1 - Chemical Product and Company Identification

**MSDS Name:** Aniline

**Synonyms:** Aminobenzene; Aniline oil; Benzenamine; Phenylamine.

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
62-53-3	Aniline	99	200-539-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to brown liquid. Flash Point: 70 deg C.

**Warning!** Harmful if swallowed, inhaled, or absorbed through the skin. Causes eye, skin, and respiratory tract irritation. **Combustible liquid and vapor.** Impairs the oxygen carrying capacity of the blood. May cause nervous system effects. May cause methemoglobinemia. May cause liver and kidney damage. Hygroscopic (absorbs moisture from the air).

**Target Organs:** Blood, kidneys, liver, spleen, respiratory system, eyes, nervous system, skin.

**Potential Health Effects**

**Eye:** Causes severe eye irritation. May cause lacrimation (tearing), blurred vision, and photophobia. May cause chemical conjunctivitis and corneal damage.

**Skin:** Causes skin irritation. Harmful if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Vapors are readily absorbed through the skin.

**Ingestion:** Harmful if swallowed. Aniline acts through an intermediate to change hemoglobin to methemoglobin. In one subject, 65 mg of aniline increased the methemoglobin level by 16% within 2 hours. Intense methemoglobinemia may lead to asphyxia severe enough to injure the cells of the central nervous system. Pathologic findings in acute fatalities from aniline include chocolate color of the blood; injury to the kidney, liver and spleen; and hemolysis. Alcohol can intensify the ability of aniline to induce methemoglobinemia.

**Inhalation:** Harmful if inhaled. Causes respiratory tract irritation. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown blood. Inhalation of aniline causes anoxia due to the formation of methemoglobin.

**Chronic:** May cause liver and kidney damage. Repeated exposure may cause sensitization dermatitis. Chronic exposure may cause hemolysis of the red blood cells followed by stimulation of the bone marrow. May cause cyanosis - a blue-gray coloring of the skin and lips caused by a lack of oxygen. Animal studies have reported the development of tumors.



#### Section 4 - First Aid Measures

**Eyes:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

**Skin:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

**Ingestion:** If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

**Notes to Physician:** Absorption of this product into the body may cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Moderate degrees of cyanosis need to be treated only by supportive measures: bed rest and oxygen inhalation. Cleansing of the entire contaminated area of the body is of utmost importance. Do not administer alcohol in any form. Individuals with liver or kidney disorders, impaired cardiovascular status, or a history of alcoholism may be more susceptible to the effects of this product. Effects may be delayed. If cyanosis is severe, intravenous injection of Methylene Blue, 1mg/kg of body weight may be of value.

#### Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Combustible liquid and vapor.

**Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or appropriate foam.

**Flash Point:** 70 deg C ( 158.00 deg F)

**Autoignition Temperature:** 615 deg C ( 1,139.00 deg F)

**Explosion Limits, Lower:** 1.3 vol %

**Upper:** 11 vol %

**NFPA Rating:** (estimated) Health: 3; Flammability: 2; Instability: 0

#### Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Provide ventilation. Approach spill from upwind. Control runoff and isolate discharged material for proper disposal. Use water spray to cool and disperse vapors and protect personnel.

#### Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Empty containers retain product



residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat and flame. Avoid breathing vapor or mist.

**Storage:** Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Poison room locked. Keep away from acids. Material darkens in color on storage. Store protected from moisture. Store protected from light.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aniline	2 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	100 ppm IDLH	5 ppm TWA; 19 mg/m <sup>3</sup> TWA

### Personal Protective Equipment

**Eyes:** Wear chemical splash goggles.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** oily - colorless to brown

**Odor:** amine-like - characteristic odor

**pH:** 8.1 (0.2M soln)

**Vapor Pressure:** 0.49 mm Hg @ 25 deg C

**Vapor Density:** 3.3 (air=1)

**Evaporation Rate:** <1 (butyl acetate=1)

**Viscosity:** 4.435 cp @ 20 deg C

**Boiling Point:** 184 deg C @ 760 mmHg

**Freezing/Melting Point:** -6 deg C

**Decomposition Temperature:** Not available.

**Solubility:** Slightly soluble.

**Specific Gravity/Density:** 1.0217 @ 20°C

**Molecular Formula:** C<sub>6</sub>H<sub>7</sub>N

**Molecular Weight:** 93.13

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures. May discolor on exposure to air and light.



**Conditions to Avoid:** Light, ignition sources, excess heat, exposure to moist air or water, prolonged exposure to air, confined spaces.

**Incompatibilities with Other Materials:** Strong oxidizing agents, strong acids, hexachloromelamine, trichloromelamine.

**Hazardous Decomposition Products:** Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

**Hazardous Polymerization:** Will not occur.

## Section 11 - Toxicological Information

### RTECS#:

**CAS#** 62-53-3: BW6650000

### LD50/LC50:

**CAS#** 62-53-3:

Dermal, guinea pig: LD50 = 1290 mg/kg;  
Draize test, rabbit, eye: 102 mg Severe;  
Draize test, rabbit, eye: 20 mg/24H Moderate;  
Draize test, rabbit, skin: 20 mg/24H Moderate;  
Inhalation, mouse: LC50 = 175 ppm/7H;  
Oral, mouse: LD50 = 464 mg/kg;  
Oral, rat: LD50 = 250 mg/kg;  
Skin, rabbit: LD50 = 820 uL/kg;  
Skin, rat: LD50 = 1400 mg/kg;<BR.

### Carcinogenicity:

**CAS#** 62-53-3:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Not listed.
- **IARC:** Not listed.

**Epidemiology:** No data available.

**Teratogenicity:** Oral, mouse: TDLo = 4480 mg/kg (female 6-13 day(s) after conception)  
Effects on Newborn - growth statistics (e.g.%, reduced weight gain).

**Reproductive Effects:** No information found.

**Mutagenicity:** DNA damage: Intraperitoneal, rat = 105 mg/kg.; Sister Chromatid Exchange: Rat, Liver = 200 umol/L.; Micronucleus Test: Intraperitoneal, mouse = 50 mg/kg.; Mutation in Microorganisms: Mouse, Lymphocyte = 500 umol/L.; Specific Locus Test: Mouse, Lymphocyte = 500 mg/L.; Morphological Transformation: Mouse, Fibroblast = 800 ug/L; Cytogenetic analysis: Hamster, Ovary = 444 mg/L.

**Neurotoxicity:** No information found.

### Other Studies:

## Section 12 - Ecological Information

**Ecotoxicity:** Bacteria: *Phytobacterium phosphoreum*: EC50 = 425-488 mg/L; 5,15 min;  
Microtox test at 14.9-15.1°C Water flea *Daphnia*: LC50 = 0.10 mg/L; 48 Hr;  
Unspecified Fish: Rainbow trout: LC50 = 8.2 mg/L; Max. exposure = 7 days;  
Unspecified Fish: Bluegill/Sunfish: 1020 ppm; 1 Hr; Unspecified No data available.

**Environmental:** If released into water it will primarily be lost due to biodegradation and



in surface waters, photooxidation (half-life of the order of days). It will not bioconcentrate in fish. If spilled on land it will be lost by a combination of biodegradation, oxidation and chemical binding to components of soil. If released into air, aniline will photodegrade (estimated half-life 3.3 hr).

**Physical:** No information available.

**Other:** Dangerous to aquatic life in high concentrations.

### Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:**

CAS# 62-53-3: waste number U012 (Ignitable waste, Toxic waste).

### Section 14 - Transport Information

	IATA	
Shipping Name:	ANILINE	
Hazard Class:	6.1	
UN Number:	UN1547	
Packing Group:	II	

### Section 15 - Regulatory Information

#### Hazard Symbols:

T N

#### Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 50 Very toxic to aquatic organisms.

R 48/23/24/25 Toxic : danger of serious damage to health by prolonged exposure through inhalation, contact with skin and if swallowed.

#### Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

### Section 16 - Additional Information