MATERIAL SAFETY DATA SHEET

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Version 1.3

Section 1 - Product and Company Information

Product Name	ANILINE, 99.5+%, A.C.S. REAGENT
Product Number	242284
Brand	ALDRICH
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS MO 63103 US
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext. 5996
Fax:	800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ANILINE	62-53-3	Yes

Formula: C6H7N

Synonyms: Aminobenzene * Aminophen * Anilin (Czech) * Anilina (Italian, Polish) * Aniline and homologues (ACGIH:OSHA) * Aniline oil * Anyvim * Benzenamine * Benzene, amino * Benzidam * Blue Oil * C.I. 76000 * C.I. Oxidation Base 1 * Cyanol * Huile d'aniline (French) * Krystallin * Kyanol * NCI-C03736 * Phenylamine * RCRA waste number U012

RTECS Number: BW6650000

Section 3 - Hazards Identification

HMIS RATING
- HEALTH: 2*
- FLAMMABILITY: 2
- REACTIVITY: 0

NFPA RATING
- HEALTH: 2
- FLAMMABILITY: 2
- REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
158 °F 70 °C Method: closed cup

EXPLOSION LIMITS
Lower: 1.3 % Upper: 11 %

AUTOIGNITION TEMP
615 °C

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Combustible liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

ENVIRONMENTAL PRECAUTION(S)
Avoid contaminating water supply. Avoid contaminating sewers and waterways with this material.

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep container closed. Keep away from heat and open flame. Store in a cool dry place. Store under nitrogen.

SPECIAL REQUIREMENTS
Handle under inert gas. Light sensitive.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Government approved respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	2 PPM
Remarks: Skin			
USA	MSHA Standard-air	TWA	5 PPM (19 MG/M3)
USA	OSHA.	PEL	8H TWA 5 PPM (19 MG/M3) (SKIN)
New Zealand OEL			
Remarks: check ACGIH TLV			
USA	NIOSH		LOWEST FEASIBLE CONC.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	5 MG/M3
Poland		NDSCh	20 MG/M3
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance — Physical State: Liquid

Property	Value	At Temperature or Pressure
Molecular Weight	93.13 AMU	
pH	8.8	20 ˚C Concentration: 36 g/l
BP/BP Range	184 ˚C	760 mmHg
MP/MP Range	-6 ˚C	
Freezing Point	N/A	
Vapor Pressure	0.7 mmHg	25 ˚C
Vapor Density	3.22 g/l	184 ˚C
Saturated Vapor Conc.	N/A	
SG/Density	1.021 g/cm3	
Bulk Density	N/A	
Odor Threshold	2.44 ppm	
Volatile%	N/A	
VOC Content	N/A	
Water Content	< 0.1 %	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	4.4 Pas	20 ˚C
Surface Tension	42.12 mN/m	25 ˚C
Partition Coefficient	Log Kow: 0.91	

Decomposition Temp.	N/A
Flash Point	158 ˚F 70 ˚C Method: closed cup
Explosion Limits	Lower: 1.3 % Upper: 11 %
Flammability	N/A
Autoignition Temp	615 ˚C
Refractive Index	1.586
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water:Soluble. Solvent: Soluble. Other Solvents: MEOH, DIETHYL ETHER

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Conditions of Instability: May discolor on exposure to light.
Conditions to Avoid: Protect from moisture.
Materials to Avoid: Oxidizing agents Iron and iron salts., Zinc

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: Causes skin irritation.
Skin Absorption: Harmful if absorbed through skin. Readily absorbed through skin.
Eye Contact: Causes eye irritation.
Inhalation: Toxic if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Blood. Bladder. Kidneys. Central nervous system.

SIGNS AND SYMPTOMS OF EXPOSURE
Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer. Exposure can cause: Cyanosis. Headache. Vomiting. Nausea. Incoordination. Fatigue. Dizziness. Drowsiness. Confusion. Weakness. Unconsciousness. Symptoms may be delayed.

TOXICITY DATA
Oral
Rat
250 mg/kg
LD50
Skin
Rabbit
820 mg/kg
LD50
4 HR

Inhalation
Mouse
247.5 ppm
LC50

Oral
Rat
250 mg/kg
LD50

Skin
Rat
1400 mg/kg
LD50

Intraperitoneal
Rat
420 MG/KG
LD50

Oral
Mouse
464 mg/kg
LD50

Inhalation
Mouse
175 ppm
LC50

Intraperitoneal
Mouse
492 MG/KG
LD50

Subcutaneous
Mouse
200 MG/KG
LD50

Oral
Dog
195 mg/kg
LD50

Skin
Cat
254 mg/kg
LD50

Skin
Rabbit
820 UL/KG
LD50

Intravenous
Rabbit
64 MG/KG
LD50

Oral
Guinea pig

400 mg/kg
LD50

Skin
Guinea pig
1290 mg/kg
LD50

Intraperitoneal
Guinea pig
100 MG/KG
LD50

Oral
Quail
750 mg/kg
LD50

Oral
Mammal
500 mg/kg
LD50

Inhalation
Mammal
2,500 mg/m3
LC50

Oral
Bird (wild)
562 mg/kg
LD50

IRRITATION DATA

Skin
Rabbit
20 mg
24H
Remarks: Moderate irritation effect

Eyes
Rabbit
102 mg
Remarks: Severe irritation effect

Eyes
Rabbit
20 mg
24H
Remarks: Moderate irritation effect

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Species: Rat
Route of Application: Oral
Dose: 11 GM/KG
Exposure Time: 29W
Frequency: C

Result: Tumorigenic:Neoplastic by RTECS criteria. Kidney, Ureter, Bladder:Tumors.

Species: Rat
Route of Application: Oral
Dose: 72800 MG/KG
Exposure Time: 2Y
Frequency: C
Result: Tumorigenic:Neoplastic by RTECS criteria. Blood:Tumors.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 300 UMOL/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Rat
Route: Intraperitoneal
Dose: 105 MG/KG
Mutation test: DNA damage

Species: Rat
Dose: 300 MG/KG
Cell Type: S. typhimurium
Mutation test: Body fluid assay

Species: Rat
Dose: 200 UMOL/L
Cell Type: liver
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Intraperitoneal
Dose: 50 MG/KG
Mutation test: Micronucleus test

Species: Mouse
Dose: 500 UMOL/L (+S9)
Cell Type: lymphocyte
Mutation test: Mutation in microorganisms

Species: Mouse
Dose: 500 MG/L
Cell Type: lymphocyte
Mutation test: specific locus test

Species: Mouse
Dose: 800 UG/L
Cell Type: fibroblast
Mutation test: Morphological transformation.

Species: Mouse
Route: Intraperitoneal
Dose: 300 MG/KG
Mutation test: DNA damage

Species: Mouse

Dose: 21500 UMOL/L
Cell Type: lymphocyte
Mutation test: DNA damage

Species: Mouse
Route: Oral
Dose: 1 GM/KG
Mutation test: DNA damage

Species: Mouse
Route: Intraperitoneal
Dose: 210 MG/KG
Mutation test: Sister chromatid exchange

Species: Mouse
Dose: 2500 UMOL/L
Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 444 MG/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 50 MG/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 500 UG/L
Cell Type: lung
Mutation test: Mutation in mammalian somatic cells.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Mouse
Dose: 4480 MG/KG
Route of Application: Oral
Exposure Time: (6-13D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae
Species: SELENASTRUM
Time: 72 h
Value: 19 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 80 - 380 mg/l

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 40.7 - 59.10 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 10.96 mg/l

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 124 mg/l

ELIMINATION

Elimination: > 90 %

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Aniline
UN#: 1547
Class: 6.1
Packing Group: Packing Group II
Hazard Label: Toxic substances.
PIH: Not PIH

IATA
Proper Shipping Name: Aniline
IATA UN Number: 1547
Hazard Class: 6.1
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: T N
Indication of Danger: Toxic. Dangerous for the environment.
R: 20/21/22 40 48/23/24/25 50
Risk Statements: Harmful by inhalation, in contact with skin and if swallowed. Limited evidence of a carcinogenic effect. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Very toxic to aquatic organisms.
S: 28 36/37 45 61
Safety Statements: After contact with skin, wash immediately with plenty of soap-suds. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: Yes
DEMINIMIS: 1 %
NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65
California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer.

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.