Section 1 - Product and Company Information

Product Name                       1,4-NAPHTHOQUINONE (ALPHA)
Product Number                     70372
Brand                              FLUKA

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
1,4-NAPHTHOQUINONE (ALPHA)              130-15-4              No

Formula         C10H6O2
Synonyms        1,4-Dihydro-1,4-diketonaphthalene *
                 1,4-Naftochinon (Czech) * 1,4-Naphthalenedione *
                 alpha-Naphthoquinone * RCRA waste number U166 *
                 USAF CY-10
RTECS Number:   QL7175000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Highly Toxic (USA) Very Toxic (EU).
Toxic if swallowed. Very toxic by inhalation. Irritating to eyes,
respiratory system and skin. May cause sensitization by skin
contact. Very toxic to aquatic organisms.
Target organ(s): Blood. Liver.

HMIS RATING
HEALTH: 4*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING
HEALTH: 4
FLAMMABILITY: 0
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
N/A

AUTOIGNITION TEMP
N/A

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): 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.

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 tightly closed.

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.

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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<tbody>
<tr>
<td>Appearance</td>
<td>Physical State: Solid</td>
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<tr>
<td>Color</td>
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<tr>
<td>Form</td>
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<td>Vapor Pressure</td>
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<td>Other Solvents: ETHANOL</td>
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</table>

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
- Stable
- Materials to Avoid: Strong oxidizing agents, Strong reducing agents.

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

HAZARDOUS POLYMERIZATION
- Hazardous Polymerization: Will not occur
Section 11 - Toxicological Information

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

SENSITIZATION
Sensitization: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

TARGET ORGAN(S) OR SYSTEM(S)
Blood. Liver.

SIGNS AND SYMPTOMS OF EXPOSURE
Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA
Inhalation
Rat
46 mg/m3
LC50

Oral
Rat
190 mg/kg
LD50
Nutritional and Gross Metabolic: Weight loss or decreased weight gain.

Subcutaneous
Rat
202 MG/KG
LD50

Intraperitoneal
Mouse
5500 UG/KG
LD50
Remarks: Tumorigenic: Active as anti-cancer agent.

Oral
Guinea pig
400 mg/kg
LD50
Nutritional and Gross Metabolic: Weight loss or decreased weight gain.

Oral
Bird (wild)
133 mg/kg
LD50
**CHRONIC EXPOSURE - CARCINOGEN**

Species: Mouse  
Route of Application: Skin  
Dose: 800 MG/KG  
Exposure Time: 29W  
Frequency: C  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Lungs, Thorax, or Respiration: Tumors. Skin and Appendages: Other: Tumors.

**CHRONIC EXPOSURE - MUTAGEN**

Species: Human  
Dose: 100 UG/L  
Cell Type: lymphocyte  
Mutation test: Micronucleus test

**CHRONIC EXPOSURE - REPRODUCTIVE HAZARD**

Species: Rat  
Dose: 5 MG/KG  
Route of Application: Subcutaneous  
Exposure Time: (1D PRE)  
Result: Maternal Effects: Ovaries, fallopian tubes.

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**Section 12 - Ecological Information**

No data available.

**PHYSICAL PROPERTIES AFFECTING ECOTOXICITY**

BOD: 39 %

**ACCUMULATION**

Bioaccumulation Potential: No indication of bioaccumulation.

**ACUTE ECOTOXICITY TESTS**

Test Type: IC50 Algae  
Time: 72 h  
Value: 0.011 mg/l

Test Type: LC50 Bacteria  
Time: 96 h  
Value: 0.1 mg/l

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**Section 13 - Disposal Considerations**

**APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION**

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

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**Section 14 - Transport Information**

**DOT**

Proper Shipping Name: Toxic solids, organic, n.o.s.  
UN#: 2811  
Class: 6.1
Packing Group: Packing Group I
Hazard Label: Toxic substances.

IATA
Proper Shipping Name: Toxic solid, organic, n.o.s.
IATA UN Number: 2811
Hazard Class: 6.1
Packing Group: I

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: T+ N
Indication of Danger: Very toxic. Dangerous for the environment.
R: 25 26 36/37/38 43 50
Risk Statements: Toxic if swallowed. Very toxic by inhalation.
Irritating to eyes, respiratory system and skin. May cause sensitization by skin contact. Very toxic to aquatic organisms.
S: 26 36/37 45 61
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. 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.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Highly Toxic (USA) Very Toxic (EU).
Risk Statements: Toxic if swallowed. Very toxic by inhalation.
Irritating to eyes, respiratory system and skin. May cause sensitization by skin contact. Very toxic to aquatic organisms.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. 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: No
TSCA INVENTORY ITEM: Yes Yes

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. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc.,
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