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MATERIAL SAFETY DATA SHEETS FOR CYANOTYPE CHEMICALS

POTASSIUM FERRICYANIDE

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Name: POTASSIUM FERRICYANIDE CAS:13746-66-2 RTECS #:LJ8225000 = Wt:100.
=====
LC50 Mixture: LD50 (ORAL, RAT) 2263 MG/KG Reports of Carcinogenicity: NTP:NO
IARC:NO OSHA:NO Health Hazards Acute and Chronic: EFFECTS OF EXPOSURE:
INHALATION: EXPECTED TO BE A LOW HAZARD FOR RECOMMENDED HANDLING. IF
CYANIDE GAS IS LIBERATED DUE TO CONTACT WITH A STRONG ACID, IT MAY CAUSE
DIZZINESS, HEADACHE, RAPID RESPIRATION, RAPID PULSE, UNCONSCIOUSNESS,
CONVULSIONS AND DEATH. EYES: CAUSES IRRITATION. HOWEVER, IMMEDIATE
FLUSHING OF THE EYES WITH WATER WILL MINIMIZE ANY IRRITATIVE EFFECT.
SKIN: LOW HAZARD FOR RECOMMENDED HANDLING. INGESTION: EXPECTED TO BE A
LOW INGESTION HAZARD. Explanation of Carcinogenicity: CARCINOGENICITY
CLASSIFICATION (COMPONENTS PRESENT AT 0.1% OR MORE): - AMERICAN
CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH): NONE -
INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC): NONE - NATIONAL
TOXICOLOGY PROGRAM (NTP): NONE - OCCUPATIONAL SAFETY AND HEALTH
ADMINISTRATION (OSHA): NONE Effects of Overexposure: INHALATION: IF
CYANIDE GAS IS LIBERATED DUE TO CONTACT WITH A STRONG ACID, IT MAY CAUSE
DIZZINESS, HEADACHE, RAPID RESPIRATION, RAPID PULSE, UNCONSCIOUSNESS,
CONVULSIONS AND DEATH. EYES: CAUSES IRRITATION. Medical Cond Aggravated
by Exposure: NOT PROVIDED. ===== First Aid Measures
=====
AIR. TREAT SYMPTOMATICALLY. GET MEDICAL ATTENTION IF SYMPTOMS PERSIST.
EYES: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET
MEDICAL ATTENTION IF SYMPTOMS PERSIST. SKIN: WASH WITH SOAP AND WATER.
GET MEDICAL ATTENTION IF SYMPTOMS OCCUR. INGESTION: DRINK 1-2 GLASSES OF
WATER. SEEK MEDICAL ATTENTION. NEVER GIVE ANYTHING BY MOUTH TO AN UN
CONSCIOUS PERSON. ===== Fire Fighting Measures
=====
Extinguishing Media: WATER SPRAY, CARBON DIOXIDE (CO2),
DRY CHEMICAL Fire Fighting Procedures: WEAR SELF-CONTAINED BREATHING APPARATUS
AND PROTECTIVE CLOTHING. FIRE OR EXCESSIVE HEAT MAY PRODUCE HAZARDOUS
DECOMPOSITION PRODUCTS. Unusual Fire/Explosion Hazard: POWDERED MATERIAL MAY
FORM EXPLOSIVE DUST-AIR MIXTURES. FIRE OR HIGH TEMPERATURES MAY CAUSE
DECOMPOSITION. ===== Accidental Release Measures
=====
Spill Release Procedures: COLLECT UP AND PUT IN A SUITABLE
CONTAINER. AVOID GENERATING DUST. CLEAN SURFACE THOROUGHLY TO REMOVE
RESIDUAL CONTAMINATION. Neutralizing Agent: NOT PROVIDED.
=====
Handling and Storage
and Storage Precautions: KEEP CONTAINER TIGHTLY CLOSED. KEEP AWAY FROM
INCOMPATIBLE SUBSTANCES (SEE INCOMPATIBILITY SECTION). KEEP FROM CONTACT
WITH OXIDIZING MATERIALS. KEEP AWAY FROM HEAT. POWDERED MATERIAL MAY FORM
EXPLOSIVE DUST-AIR MIXTURES. MINIMIZE DUST GENERATION AND ACCUMULATION.
KEEP AWAY FROM SOURCES OF IGNITION. Other Precautions: AVOID PROLONGED OR
REPEATED BREATHING OF DUST. AVOID CONTACT WITH EYES AND PROLONGED OR
REPEATED CONTACT WITH SKIN. USE WITH ADEQUATE VENTILATION. WASH
THOROUGHLY AFTER HANDLING. ===== Exposure Controls/Personal
Protection ===== Respiratory Protection: NONE SHOULD BE NEEDED. A
FULL-FACE POSITIVE-PRESSURE AIR-SUPPLIED RESPIRATOR MUST BE WORN IF
HAZARDOUS DECOMPOSITION PRODUCTS ARE LIKELY TO BE RELEASED OR HAVE BEEN
RELEASED. SEE STABILITY AND REACTIVITY SECTION. IF RESPIRATORS ARE USED,

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A PROGRAM SHOULD BE INSTITUTED TO ASSURE COMPLIANCE WITH OSHA STANDARD 29 CFR 1910.134. Ventilation:GOOD GENERAL VENTILATION (TYPICALLY 10 AIR CHANGES PER HOUR) SHOULD BE USED. VENTILATION RATES SHOULD BE MATCHED TO CONDITIONS. Protective Gloves:WEAR IMPERVIOUS GLOVES AND PROTECTIVE CLOTHING APPROPRIATE FOR RISK OF EXPOSURE Eye Protection:WEAR SAFETY GLASSES WITH SIDE SHIELDS (OR GOGGLES). Other Protective Equipment:EYE BATH, WASHING FACILITIES, SAFETY SHOWER Work Hygienic Practices:NOT PROVIDED Supplemental Safety and Health SUPPLEMENTARY LOCAL EXHAUST VENTILATION, CLOSED SYSTEMS, OR RESPIRATORY PROTECTION MAY BE NEEDED IN SPECIAL CIRCUMSTANCES SUCH AS POORLY VENTILATED SPACES, MECHANICAL GENERATION OF DUSTS, HEATING, DR YING, ETC. ===== Physical/Chemical Properties =====
HCC:N1 NRC/State Lic Num:NOT RELEVANT. Boiling Pt:B.P. Text:NOT RELEVANT. Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES Decomp Temp:Decomp Text:NOT PROVIDED Vapor Pres:NEGLIGIBLE Spec Gravity:1.89 Solubility in Water:APPRECIABLE Appearance and Odor:RED SOLID - ODORLESS Percent Volatiles by Volume:NEGLIGIBLE Corrosion Rate:NOT PROVIDED ===== Stability and Reactivity Data ===== Stability Indicator/Materials to Avoid:YES STRONG OXIDIZING AGENTS, STRONG ACIDS. CONTACT WITH ACID LIBERATES FLAMMABLE MATERIAL, TOXIC GAS. Stability Condition to Avoid:STABLE. NO EXOTHERM TO: 310C BY HPDSC Hazardous Decomposition Products:CARBON DIOXIDE, CARBON MONOXIDE, OXIDES OF NITROGEN, CYANIDES. ===== Toxicological Information =====
Toxicological Information:ACUTE TOXICITY DATA:
ORAL LD-50 (RAT): 2263 MG/KG DERMAL LD-50: 1 G/KG EYE IRRITATION (UNWASHED EYES): MODERATE EYE IRRITATION (WASHED EYES): SLIGHT SKIN IRRITATION: SLIGHT ===== Ecological Information =====
Ecological:POTENTIAL TOXICITY: FISH LC50 MG/L: >100. DAPHNID EC50 MG/L: 1-10. ALGAL IC50 MG/L: NOT AVAILABLE. ORGANICS READILY DEGRADABLE (>70%): NOT APPLICABLE. POTENTIAL BIOACCUMULATION: LOG POW <1. C OD (APPROXIMATE G/L): 605. BOD5 (APPROXIMATE G/L): 20. POTENTIAL TOXICITY: WASTE TREATMENT MICROORGANISMS EC50 (MG/L): NOT AVAILABLE. ===== Waste Disposal Disposal Considerations ===== Waste Disposal Methods:DISCHARGE, TREATMENT, OR DISPOSAL MAY BE SUBJECT TO NATIONAL, STATE, OR LOCAL LAWS. CONTRACT WITH A LICENSED CHEMICAL DISPOSAL AGENCY. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUE, FOLLOW LABEL WARNINGS EVEN AFTER CONTAINER IS EMPTIED. ===== MSDS Transport Information =====
Transport Information:FOR TRANSPORTATION INFORMATION REGARDING THIS PRODUCT CALL THE KODAK WORLDWIDE TRANSPORTATION HAZMAT HOT LINE: (716) 722-2400 BETWEEN 8 A.M. AND 5 P.M. (EASTERN STANDARD TIME), MONDAY THROUGH FRIDAY. ===== Regulatory Information =====
SARA Title III Information:CHEMICAL(S) SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OR TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986 AND 40 CFR PART 372: NONE Federal Regulatory Information:NOT PROVIDED. State Regulatory Information:MATERIAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER: NONE - MATERIAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE ADVERSE REPRODUCTIVE EFFECTS: NONE ===== Other Information =====
Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular

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FERRIC AMMONIUM CITRATE

1. Product Identification

Synonyms: Citric acid, ammonium iron (3+) salt; ammonium ferric citrate; 1,2,3-propanetricarboxylic acid, 2-hydroxy-, ammonium iron (3+) salt; Ferric ammonium citrate, Brown; Ferric ammonium citrate, Green

CAS No.: 1185-57-5

Molecular Weight: Not applicable to mixtures.

Chemical Formula: C₆H₈O₇.xFe.xNH₃

Product Codes: 1977, 1980

2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent |
|------------|--------------------------------|-----------|
| Hazardous | | |
| ----- | ----- | ----- |
| 90 - 100% | Ferric Ammonium Citrate Yes | 1185-57-5 |

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)

Flammability Rating: 1 - Slight

Reactivity Rating: 1 - Slight

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:

Inhalation of dust may cause irritation to the upper respiratory tract.

Ingestion:

Low toxicity in small quantities but larger dosages may cause nausea, vomiting, diarrhea, and black stool. Pink urine discoloration is a strong indicator of iron poisoning. Liver damage, coma, and death from iron poisoning has been recorded.

Skin Contact:

Mild irritant to skin due to acidic nature of ferric salts.

Eye Contact:

Mild irritant due to acidic nature of ferric salts.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

Skin Contact:

Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact:

Wash thoroughly with running water. Get medical advice if irritation develops.

5. Fire Fighting Measures

Fire:

As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Protect from light. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-ACGIH Threshold Limit Value (TLV):
1 mg/m³ (TWA) soluble iron salt as Fe

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Safety glasses. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Ferric Ammonium Citrate Brown - 16.5-18.5% iron Ferric Ammonium Citrate Green - 14.5-16.0% iron

Appearance:

Green or reddish-brown powder.

Odor:

Odorless to slight ammonia odor.

Solubility:

Very soluble in water.

Density:

No information found.

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

No information found.

Melting Point:

No information found.

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

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10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Reduced to ferrous salt by exposure to light.

Very deliquescent; forms a solution on prolonged exposure to air.

Hazardous Decomposition Products:

Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Iodides, acacia preparations, and tannins.

Conditions to Avoid:

Heat, light, moisture.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

-----\Cancer

Lists\-----

---NTP Carcinogen--- Ingredient

Known

Anticipated

IARC Category

Ferric Ammonium Citrate (1185-57-5)

No

No

None

12. Ecological Information

Environmental Fate:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(FERRIC AMMONIUM CITRATE)

Hazard Class: 9

UN/NA: UN3077

Packing Group: III

Information reported for product/size: 25KG

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International (Water, I.M.O.)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(FERRIC AMMONIUM CITRATE)

Hazard Class: 9

UN/NA: UN3077

Packing Group: III

Information reported for product/size: 25KG

International (Air, I.C.A.O.)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(FERRIC AMMONIUM CITRATE)

Hazard Class: 9

UN/NA: UN3077

Packing Group: III

Information reported for product/size: 25KG

15. Regulatory Information

-----\Chemical Inventory Status - Part
 1\----- Ingredient
 TSCA EC Japan Australia -----
 ----- Ferric Ammonium Citrate (1185-57-5)
 Yes Yes Yes Yes
 -----\Chemical Inventory Status - Part 2\-----
 --Canada-- Ingredient ----- Korea DSL
 NDSL Phil. -----
 ----- Ferric Ammonium Citrate (1185-57-5) ----- Yes Yes
 No Yes -----\Federal, State & International
 Regulations - Part 1\-----
 -SARA 302- -----SARA 313----- Ingredient
 RQ TPQ List Chemical Catg.

 Ferric Ammonium Citrate (1185-57-5) No No No No
 -----\Federal, State & International Regulations - Part 2\-----
 -RCRA- -TSCA- Ingredient ----- CERCLA
 261.33 8(d) -----
 ----- Ferric Ammonium Citrate (1185-57-5) ----- 1000 No
 No -----
 Chemical Weapons Convention: No TSCA 12(b): No
 CDTA: No SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
 Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

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NFPA Ratings: Health: **0** Flammability: **1** Reactivity: **0**

Label Hazard Warning:

CAUTION! MAY BE HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

Label Precautions:

Wash thoroughly after handling.
Avoid breathing dust.
Avoid contact with skin and eyes.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In all cases call a physician.

Product Use:

Laboratory Reagent.

Dharma Trading

FIBER ART SUPPLIES & CLOTHING BLANKS SINCE 1999

COLOR
ON
FABRIC