

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Oxalic Acid, Dihydrate, ACS Grade

SECTION 1: Identification of the substance/mixture and of the supplier

Product name: Oxalic Acid, Dihydrate, ACS Grade

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: KEMOX3005-20G

Recommended uses of the product and restrictions on use: Laboratory

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331
(717) 632-1291

Supplier Details:

AquaPhoenix Scientific Inc.
9 Barnhart Drive, Hanover PA 17331
(717) 632-1291

Emergency telephone number:

Emergency Telephone No.: 800-255-3924

SECTION 2: Hazards identification

Classification of the substance or mixture:



Corrosive



Irritant

Acute toxicity, Oral (Category 4), H302.

Acute toxicity, Dermal (Category 4), H312.

Serious eye damage (Category 1), H318.

Signal word: Danger

Hazard statements:

Harmful if swallowed.

Harmful in contact with skin.

Causes serious eye damage.

Precautionary statements:

If medical advice is needed have product container or label at hand.

Keep out of reach of children.

Read label before use.

Do not eat, drink or smoke when using this product.

Wash thoroughly after handling.

Wear protective gloves/protective clothing/eye protection/face protection.

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN: Wash with soap and water.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Oxalic Acid, Dihydrate, ACS Grade

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
Wash contaminated clothing before reuse.
Store in a well ventilated place. Keep container tightly closed.
Dispose of contents and container to an approved waste disposal plant.

Other Non-GHS Classification: None

SECTION 3: Composition/information on ingredients

Ingredients:

| Ingredients: | | |
|---------------------------|-----------------------|-------|
| CAS 6153-56-6 | Oxalic acid dihydrate | >99 % |
| Percentages are by weight | | |

SECTION 4: First aid measures

Description of first aid measures

After inhalation:

Loosen clothing as necessary and position individual in a comfortable position. Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen. Get medical assistance if cough or other symptoms appear.

After skin contact:

Rinse/flush exposed skin gently using soap and water for 15-20 minutes. Seek medical advice if discomfort or irritation persists.

After eye contact:

Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed:

Irritation. Nausea. Headache. Shortness of breath.

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician. Physician should treat symptomatically.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition. Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

Unsuitable extinguishing agents: None

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors. Thermal decomposition can lead to release of irritating gases and vapors.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Oxalic Acid, Dihydrate, ACS Grade

Advice for firefighters:

Protective equipment:

Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions):

Move product containers away from fire or keep cool with water spray as a protective measure, where feasible. Use spark-proof tools and explosion-proof equipment. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Ensure that air-handling systems are operational. Ensure adequate ventilation.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13. Should not be released into environment.

Methods and material for containment and cleaning up:

Keep in suitable closed containers for disposal. Wear protective eyewear, gloves, and clothing. Always obey local regulations. Refer to Section 8. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air. Collect solids in powder form using vacuum with HEPA filter. Evacuate personnel to safe areas.

Reference to other sections: None

SECTION 7: Handling and storage

Precautions for safe handling:

Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Do not eat, drink, smoke, or use personal products when handling chemical substances. Avoid contact with eyes, skin, and clothing.

Conditions for safe storage, including any incompatibilities:

Store away from incompatible materials. Protect from freezing and physical damage. Keep away from food and beverages. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store in cool, dry conditions in well sealed containers. Store with like hazards.

SECTION 8: Exposure controls/personal protection



Control parameters:

6153-56-6, Oxalic acid dihydrate, 1 mg/m³ USA. ACGIH Threshold Limit Values (TLV).
6153-56-6, Oxalic acid dihydrate, STEL 2 mg/m³ USA. ACGIH Threshold Limit Values (TLV).

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Oxalic Acid, Dihydrate, ACS Grade

- Appropriate engineering controls:** Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or dusts (total/respirable) below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use under a fume hood.
- Respiratory protection:** Not required under normal conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. When necessary use NIOSH approved breathing equipment.
- Protection of skin:** Select glove material impermeable and resistant to the substance. Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves. Wear protective clothing.
- Eye protection:** Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses or goggles are appropriate eye protection.
- General hygienic measures:** Perform routine housekeeping. Wash hands before breaks and at the end of work. Avoid contact with skin, eyes, and clothing. Before wearing wash contaminated clothing.

SECTION 9: Physical and chemical properties

| | | | |
|--|---------------------------------|--|--|
| Appearance (physical state, color): | Crystalline | Explosion limit lower: Explosion limit upper: | Not determined Not determined |
| Odor: | Not determined | Vapor pressure at 20°C: | < 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) |
| Odor threshold: | Not determined | Vapor density: | Not determined |
| pH-value: | 1 at 126.1 g/l at 25 °C (77 °F) | Relative density: | Not determined |
| Melting/Freezing point: | Melting point/range: | Solubilities: | None |
| Boiling point/Boiling range: | Not determined | Partition coefficient (n-octanol/water): | log pow: - 0.81 |
| Flash point (closed cup): | Not determined | Auto/Self-ignition temperature: | Not determined |
| Evaporation rate: | Not determined | Decomposition temperature: | Not determined |
| Flammability (solid, gaseous): | Not determined | Viscosity: | a. Kinematic: Not determined b. Dynamic: Not determined |
| Density at 20°C: | Not determined | | |
| Water solubility | ca.126.1 g/l at 20 °C (68 °F) | | |

SECTION 10: Stability and reactivity

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Oxalic Acid, Dihydrate, ACS Grade

Reactivity:

Nonreactive under normal conditions.

Chemical stability:

Stable under normal conditions.

Possible hazardous reactions:

None under normal processing.

Conditions to avoid:

Incompatible Materials.

Incompatible materials:

Strong acids. Strong bases. Oxidizing agents.

Hazardous decomposition products: None

SECTION 11: Toxicological information

Acute Toxicity: No additional information.

Chronic Toxicity: No additional information.

Skin corrosion/irritation: No additional information.

Serious eye damage/irritation: No additional information.

Respiratory or skin sensitization: No additional information.

Carcinogenicity:

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Germ cell mutagenicity: No additional information.

Reproductive Toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

SECTION 12: Ecological information

Ecotoxicity:

Toxicity to fish , LC50 - *Leuciscus idus* (Golden orfe) - 160 mg/l - 48 h.

Toxicity to daphnia and other aquatic invertebrates, EC50 - *Daphnia magna* (Water flea) - 137 mg/l - 48 h.

Persistence and degradability: No additional information.

Bioaccumulative potential: No additional information.

Mobility in soil: No additional information.

Other adverse effects: No additional information.

SECTION 13: Disposal considerations

Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material. Dispose of empty containers as unused product. Product or containers must not be disposed with household garbage. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Oxalic Acid, Dihydrate, ACS Grade

SECTION 14: Transport information

US DOT

UN Number:

ADR, ADN, DOT, IMDG, IATA

3261

Limited Quantity Exception:

None

Bulk:

RQ (if applicable): None

Proper shipping Name: Corrosive solid, acidic, organic, n.o.s. (Oxalic acid dihydrate).

Hazard Class: None

Packing Group: III.

Marine Pollutant (if applicable): No additional information.

Comments: None

Non Bulk:

RQ (if applicable): None

Proper shipping Name: Corrosive solid, acidic, organic, n.o.s. (Oxalic acid dihydrate).

Hazard Class: None

Packing Group: III.

Marine Pollutant (if applicable): No additional information.

Comments: None

SECTION 15: Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

None of the ingredients are listed.

RCRA (hazardous waste code):

None of the ingredients are listed.

TSCA (Toxic Substances Control Act) :

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

None of the ingredients are listed.

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

Canada

Canadian Domestic Substances List (DSL) :

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Oxalic Acid, Dihydrate, ACS Grade

All ingredients are listed.

SECTION 16: Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

NFPA: 2-0-0

HMIS: 2-0-0

GHS Full Text Phrases: None

Abbreviations and Acronyms:

IMDG International Maritime Code for Dangerous Goods.
IATA International Air Transport Association.
GHS Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH American Conference of Governmental Industrial Hygienists.
CAS Chemical Abstracts Service (division of the American Chemical Society).
NFPA National Fire Protection Association (USA).
HMIS Hazardous Materials Identification System (USA).
WHMIS Workplace Hazardous Materials Information System (Canada).
DNEL Derived No-Effect Level (REACH).
PNEC. Predicted No-Effect Concentration (REACH).
CFR Code of Federal Regulations (USA).
SARA Superfund Amendments and Reauthorization Act (USA).
RCRA. Resource Conservation and Recovery Act (USA).
TSCA. Toxic Substances Control Act (USA).
NPRI National Pollutant Release Inventory (Canada).
DOT US Department of Transportation.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

Cobalt Chloride, Lab Grade

SECTION 1: Identification of the substance/mixture and of the supplier

Product name: Cobalt Chloride, Lab Grade

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: CC1650-30G

Recommended uses of the product and restrictions on use: Laboratory

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331
(717) 632-1291

Supplier Details:

AquaPhoenix Scientific, Inc
9 Barnhart Drive, Hanover, PA 17331
(717) 632-1291

Emergency telephone number:

Emergency Telephone No.: 800-255-3924

SECTION 2: Hazards identification

Classification of the substance or mixture:



Irritant

Acute toxicity (oral, dermal, inhalation), category 4
Skin sensitization, category 1
Respiratory sensitization, category 1



Health hazard

Germ cell mutagenicity, category 2
Carcinogenicity, category 1B
Reproductive toxicity, category 1B



Environmentally Damaging

Acute hazards to the aquatic environment, category 1
Chronic hazards to the aquatic environment, category 1

Acute Tox. 4 H302.

Hazards Not Otherwise Classified - Combustible Dust.

Skin Sens. 1 H317.

Resp. Sens. 1 H334.

Muta. 2 H341.

Carc. 1B H350.

Repr. 1B H360.

Aquatic Acute 1 H400.

Aquatic Chronic 1 H410.

Signal word: Danger

Hazard statements:

Harmful if swallowed.

May cause an allergic skin reaction.

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Suspected of causing genetic defects.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

Cobalt Chloride, Lab Grade

May cause cancer.
May damage fertility or the unborn child.
Very toxic to aquatic life with long lasting effects.

Precautionary statements:

If medical advice is needed have product container or label at hand.
Keep out of reach of children.
Read label before use.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
Use personal protective equipment as required.
Specific treatment (see supplemental first aid instructions on this label).
Rinse mouth.
Collect spillage.
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
IF ON SKIN: Wash with soap and water.
If skin irritation or a rash occurs: Get medical advice/attention.
Store in a dry place.
Store locked up.
Dispose of contents/container.

Other Non-GHS Classification: None

SECTION 3: Composition/information on ingredients

Ingredients:

| Ingredients: | | |
|---------------------------|-------------------------------|-------|
| CAS 7791-13-1 | Cobalt dichloride hexahydrate | 100 % |
| Percentages are by weight | | |

SECTION 4: First aid measures

Description of first aid measures

After inhalation:

Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Seek medical advice if discomfort or irritation persists. If breathing difficult, give oxygen. DO NOT use mouth-to-mouth resuscitation.

After skin contact:

Wash affected area with soap and water. Rinse/flush exposed skin gently using water for 15-20 minutes. Seek medical advice if discomfort or irritation persists.

After eye contact:

Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

Cobalt Chloride, Lab Grade

After swallowing:

Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Irritation. Nausea. Headache. Shortness of breath.

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing agents:

If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

Unsuitable extinguishing agents: None

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors. Thermal decomposition can lead to release of irritating gases and vapors. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Advice for firefighters:

Protective equipment:

Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions):

Move product containers away from fire or keep cool with water spray as a protective measure, where feasible. Use spark-proof tools and explosion-proof equipment.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Transfer to a disposal or recovery container. Use spark-proof tools and explosion-proof equipment. Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources. Protect from heat. Stop the spill, if possible. Contain spilled material by diking or using inert absorbent.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13.

Methods and material for containment and cleaning up:

If in a laboratory setting, follow Chemical Hygiene Plan procedures. Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air. Collect solids in powder form using vacuum with HEPA filter.

Reference to other sections: None

SECTION 7: Handling and storage

Precautions for safe handling:

Minimize dust generation and accumulation. Wash hands after handling. Avoid dispersal of dust in the air. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Follow good hygiene procedures when handling chemical materials. Do not eat, drink, smoke, or use personal products

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

Cobalt Chloride, Lab Grade

when handling chemical substances. If in a laboratory setting, follow Chemical Hygiene Plan. Use only in well ventilated areas. Avoid generation of dust or fine particulate. Avoid contact with eyes, skin, and clothing.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents. Store in cool, dry conditions in well sealed containers. Keep container tightly closed. Store with like hazards.

SECTION 8: Exposure controls/personal protection



Control parameters:

7791-13-1, Cobalt (II) chloride hexahydrate, ACGIH TLV: 0.02 mg/m³, OSHA PEL: NA.

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or dusts (total/respirable) below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Use under a fume hood. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Respiratory protection:

Not required under normal conditions of use. Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable.

Protection of skin:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Eye protection:

Safety glasses with side shields or goggles.

General hygienic measures:

The usual precautionary measures are to be adhered to when handling chemicals. Keep away from food, beverages and feed sources. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases/fumes/dust/mist/vapor/aerosols. Avoid contact with the eyes and skin.

SECTION 9: Physical and chemical properties

| | | | |
|--|----------------------|--------------------------------|--------------------|
| Appearance (physical state, color): | Pink to red crystals | Explosion limit lower: | Not determined |
| | | Explosion limit upper: | Not determined |
| Odor: | Odorless | Vapor pressure at 20°C: | Not determined |
| Odor threshold: | Not determined | Vapor density: | Not determined |
| pH-value: | 4.6 (0.2M solution) | Relative density: | 1.924 |
| Melting/Freezing point: | 87°C (189°F) | Solubilities: | 76.7g/ 100mL (0°C) |

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

| Cobalt Chloride, Lab Grade | | | |
|---------------------------------------|-----------------|---|--|
| Boiling point/Boiling range: | 1049°C (1920°F) | Partition coefficient (n-octanol/water): | Not determined |
| Flash point (closed cup): | Not determined | Auto/Self-ignition temperature: | Not determined |
| Evaporation rate: | Not determined | Decomposition temperature: | 110°C (230°F) |
| Flammability (solid, gaseous): | Not determined | Viscosity: | a. Kinematic: Not determined b. Dynamic: Not determined |
| Density at 20°C: | Not determined | | |
| Molecular Weight: | 237.95 | | |

SECTION 10: Stability and reactivity

Reactivity:

Nonreactive under normal conditions.

Chemical stability:

No decomposition if used and stored according to specifications.

Possible hazardous reactions:

Nonreactive under normal conditions.

Conditions to avoid:

Store away from oxidizing agents, strong acids or bases. moisture. Dust generation, moisture, excessive heat.

Incompatible materials:

Strong acids. Strong bases. potassium and metal halides. sodium dispersions. t-butyl hydroperoxide. strong mineral acids.

Hazardous decomposition products:

Carbon oxides (CO, CO₂). Heating to decomposition may lead to the release of toxic fumes of Chlorides and Cobalt Oxides.

SECTION 11: Toxicological information

Acute Toxicity:

Dermal:

LD50 Rat >2,000 mg/kg.

Chronic Toxicity: No additional information.

Skin corrosion/irritation: No additional information.

Serious eye damage/irritation: No additional information.

Respiratory or skin sensitization: No additional information.

Carcinogenicity:

IARC: 2B - Group 2B; Possibly carcinogenic to humans (Cobalt dichloride hexahydrate)

Germ cell mutagenicity:

In vitro tests showed mutagenic effects.

Mouse - mammary gland - Mutation in mammalian somatic cells.

Reproductive Toxicity:

Presumed human reproductive toxicant.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

Cobalt Chloride, Lab Grade

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

SECTION 12: Ecological information

Ecotoxicity:

Fish., LC50 - Cyprinus carpio (Carp) - 0.33 mg/l - 96.0 h.

Invertebrates, EC50 - Daphnia magna (Water flea) - 1.1 - 1.6 mg/l - 48 h.

Algae, EC50 - Chlorella vulgaris (Fresh water algae) - 0.5 mg/l - 96 h.

Persistence and degradability:

Readily degradable in the environment.

Bioaccumulative potential: No additional information.

Mobility in soil: No additional information.

Other adverse effects: No additional information.

SECTION 13: Disposal considerations

Waste disposal recommendations:

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.

SECTION 14: Transport information

US DOT

UN Number:

ADR, ADN, DOT, IMDG, IATA

3260

Limited Quantity Exception:

None

Bulk:

RQ (if applicable): None

Proper shipping Name: Corrosive solid, acidic, inorganic, N.O.S.

Hazard Class: 8

Packing Group: III.

Marine Pollutant (if applicable): No additional information.

Comments: None

Non Bulk:

RQ (if applicable): None

Proper shipping Name: Corrosive solid, acidic, inorganic, N.O.S.

Hazard Class: 8

Packing Group: III.

Marine Pollutant (if applicable): No additional information.

Comments: None



SECTION 15: Regulatory information

United States (USA)

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

Cobalt Chloride, Lab Grade

SARA Section 311/312 (Specific toxic chemical listings):

None of the ingredients are listed.

SARA Section 313 (Specific toxic chemical listings):

7791-13-1 Cobalt(II) Chloride Hexahydrate.

RCRA (hazardous waste code):

None of the ingredients are listed.

TSCA (Toxic Substances Control Act) :

7791-13-1 Cobalt(II) Chloride Hexahydrate: not listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

None of the ingredients are listed.

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

Canada

Canadian Domestic Substances List (DSL) :

7791-13-1 Cobalt(II) Chloride Hexahydrate: not listed.

SECTION 16: Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

NFPA: 3-0-0

HMIS: 3-0-0

GHS Full Text Phrases: None

Abbreviations and Acronyms:

IMDG International Maritime Code for Dangerous Goods.
PNEC. Predicted No-Effect Concentration (REACH).
CFR Code of Federal Regulations (USA).
SARA Superfund Amendments and Reauthorization Act (USA).

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.28.2014

| |
|-----------------------------------|
| Cobalt Chloride, Lab Grade |
|-----------------------------------|

RCRA. Resource Conservation and Recovery Act (USA).
TSCA. Toxic Substances Control Act (USA).
NPRI National Pollutant Release Inventory (Canada).
DOT US Department of Transportation.
IATA International Air Transport Association.
GHS Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH American Conference of Governmental Industrial Hygienists.
CAS Chemical Abstracts Service (division of the American Chemical Society).
NFPA National Fire Protection Association (USA).
HMIS Hazardous Materials Identification System (USA).
WHMIS Workplace Hazardous Materials Information System (Canada).
DNEL Derived No-Effect Level (REACH).

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Potassium Permanganate, 1.0N

SECTION 1: Identification of the substance/mixture and of the supplier

Product name: Potassium Permanganate, 1.0N

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: KEMPP1440-C

Recommended uses of the product and restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331
(717) 632-1291

Supplier Details:

AquaPhoenix Scientific Inc.
9 Barnhart Drive, Hanover PA 17331
(717) 632-1291

Emergency telephone number:

Emergency Telephone No.: 800-535-5053

SECTION 2: Hazards identification

Classification of the substance or mixture:



Environmentally Damaging

Acute hazards to the aquatic environment, category 2

Chronic hazards to the aquatic environment, category 2

Acute aquatic toxicity Category 2.

Chronic aquatic toxicity Category 2.

Signal word: None

Hazard statements:

Toxic to aquatic life with long lasting effects.

Precautionary statements:

If medical advice is needed have product container or label at hand.

Keep out of reach of children.

Read label before use.

Avoid release to the environment.

Collect spillage.

Dispose of contents and container to an approved waste disposal plant.

Other Non-GHS Classification: None

SECTION 3: Composition/information on ingredients

Ingredients:

Ingredients:

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Potassium Permanganate, 1.0N

| | | |
|---------------------------|------------------------|---------|
| CAS 7722-64-7 | Potassium Permanganate | 3.16 % |
| CAS 7732-18-5 | Deionized Water | 96.74 % |
| CAS 144-55-8 | Sodium Bicarbonate | 0.1 % |
| Percentages are by weight | | |

SECTION 4: First aid measures

Description of first aid measures

After inhalation:

Loosen clothing as necessary and position individual in a comfortable position. Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen. Get medical assistance if cough or other symptoms appear.

After skin contact:

Rinse/flush exposed skin gently using soap and water for 15-20 minutes. Seek medical advice if discomfort or irritation persists.

After eye contact:

Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if irritation, discomfort, or vomiting persists. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed:

Irritation. Headache. Nausea. Shortness of breath.

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing agents:

Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

Unsuitable extinguishing agents: None

Special hazards arising from the substance or mixture:

Thermal decomposition can lead to release of irritating gases and vapors.

Advice for firefighters:

Protective equipment:

Wear protective eyewear, gloves, and clothing. Use NIOSH-approved respiratory protection/breathing apparatus. Refer to Section 8.

Additional information (precautions):

Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation. Ensure that air-handling systems are operational.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Potassium Permanganate, 1.0N

Environmental precautions:

Should not be released into environment. Prevent from reaching drains, sewer, or waterway.

Methods and material for containment and cleaning up:

Wear protective eyewear, gloves, and clothing. Always obey local regulations. Containerize for disposal. Refer to Section 13. Refer to Section 8. If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Keep in suitable closed containers for disposal.

Reference to other sections: None

SECTION 7: Handling and storage

Precautions for safe handling:

Avoid contact with skin, eyes, and clothing. Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Follow proper disposal methods. Do not eat, drink, smoke, or use personal products when handling chemical substances. Refer to Section 13.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages. Protect from freezing and physical damage. Provide ventilation for containers. Keep container tightly closed. Store away from incompatible materials.

SECTION 8: Exposure controls/personal protection



Control parameters:

No applicable occupational exposure limits.

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.

Respiratory protection:

Not required under normal conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. When necessary use NIOSH approved breathing equipment.

Protection of skin:

Select glove material impermeable and resistant to the substance. Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves. Wear protective clothing.

Eye protection:

Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses or goggles are appropriate eye protection.

General hygienic measures:

Perform routine housekeeping. Wash hands before breaks and at the end of work. Avoid contact with skin, eyes, and clothing. Before wearing wash contaminated clothing.

SECTION 9: Physical and chemical properties

| | | | |
|--|--------|-------------------------------|----------------|
| Appearance (physical state, color): | Liquid | Explosion limit lower: | Not determined |
| | | Explosion limit upper: | Not determined |

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Potassium Permanganate, 1.0N

| | | | |
|---------------------------------------|----------------|---|--|
| Odor: | Odorless | Vapor pressure at 20°C: | Not determined |
| Odor threshold: | Not determined | Vapor density: | Not determined |
| pH-value: | Not determined | Relative density: | Not determined |
| Melting/Freezing point: | approx -2°C | Solubilities: | soluble |
| Boiling point/Boiling range: | approx 101°C | Partition coefficient (n-octanol/water): | Not determined |
| Flash point (closed cup): | Not determined | Auto/Self-ignition temperature: | Not determined |
| Evaporation rate: | Not determined | Decomposition temperature: | Not determined |
| Flammability (solid, gaseous): | Not determined | Viscosity: | a. Kinematic: Not determined b. Dynamic: Not determined |
| Density at 20°C: | Not determined | | |

SECTION 10: Stability and reactivity

Reactivity:

Nonreactive under normal conditions.

Chemical stability:

Stable under normal conditions.

Possible hazardous reactions:

None under normal processing.

Conditions to avoid:

Incompatible materials.

Incompatible materials: None

Hazardous decomposition products: None

SECTION 11: Toxicological information

Acute Toxicity: No additional information.

Chronic Toxicity: No additional information.

Skin corrosion/irritation: No additional information.

Serious eye damage/irritation: No additional information.

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

Germ cell mutagenicity: No additional information.

Reproductive Toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

SECTION 12: Ecological information

Ecotoxicity: No additional information.

Persistence and degradability: No additional information.

Bioaccumulative potential: No additional information.

Mobility in soil: No additional information.

Other adverse effects: No additional information.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Potassium Permanganate, 1.0N

SECTION 13: Disposal considerations

Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material. Dispose of empty containers as unused product. Product or containers must not be disposed with household garbage. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14: Transport information

US DOT

UN Number:

ADR, ADN, DOT, IMDG, IATA

Not Regulated.

Limited Quantity Exception:

None

Bulk:

RQ (if applicable): None

Proper shipping Name: Not Regulated.

Hazard Class: None

Packing Group: Not Regulated.

Marine Pollutant (if applicable): No additional information.

Comments: None

Non Bulk:

RQ (if applicable): None

Proper shipping Name: Not Regulated.

Hazard Class: None

Packing Group: Not Regulated.

Marine Pollutant (if applicable): No additional information.

Comments: None

SECTION 15: Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

None of the ingredients are listed.

SARA Section 313 (Specific toxic chemical listings):

7722-64-7 Potassium Permanganate.

RCRA (hazardous waste code):

None of the ingredients are listed.

TSCA (Toxic Substances Control Act) :

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7722-64-7 Potassium Permanganate RQ 100 LB.

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients are listed.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 10.24.2014

Potassium Permanganate, 1.0N

Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

Canada

Canadian Domestic Substances List (DSL) :

All ingredients are listed.

SECTION 16: Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

NFPA: 0-0-0

HMIS: 0-0-0

GHS Full Text Phrases: None

Abbreviations and Acronyms:

IMDG International Maritime Code for Dangerous Goods.
IATA International Air Transport Association.
GHS Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH American Conference of Governmental Industrial Hygienists.
CAS Chemical Abstracts Service (division of the American Chemical Society).
NFPA National Fire Protection Association (USA).
HMIS Hazardous Materials Identification System (USA).
WHMIS Workplace Hazardous Materials Information System (Canada).
DNEL Derived No-Effect Level (REACH).
PNEC. Predicted No-Effect Concentration (REACH).
CFR Code of Federal Regulations (USA).
SARA Superfund Amendments and Reauthorization Act (USA).
RCRA. Resource Conservation and Recovery Act (USA).
TSCA. Toxic Substances Control Act (USA).
NPRI National Pollutant Release Inventory (Canada).
DOT US Department of Transportation.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.31.2014

Ammonium Hydroxide, ACS Grade

SECTION 1: Identification of the substance/mixture and of the supplier

Product name: Ammonium Hydroxide, ACS Grade

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: KEMAH4235-AA

Recommended uses of the product and restrictions on use: Dec 15 2015 12:00AM

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331
(717) 632-1291

Supplier Details:

AquaPhoenix Scientific Inc.
9 Barnhart Drive, Hanover PA 17331
(717) 632-1291

Emergency telephone number:

Emergency Telephone No.: 800-255-3924

SECTION 2: Hazards identification

Classification of the substance or mixture:



Corrosive

Skin corrosion, category 1B



Environmentally Damaging

Acute hazards to the aquatic environment, category 1



Irritant

Specific target organ toxicity following single exposure, category 3

STOT SE 3.

AcAq Tox 1.

Skin Corr. 1B.

Signal word: Danger

Hazard statements:

Causes severe skin burns and eye damage.

May cause respiratory irritation.

Very toxic to aquatic life.

Precautionary statements:

If medical advice is needed have product container or label at hand.

Keep out of reach of children.

Read label before use.

Do not breathe dust/fume/gas/mist/vapours/spray.

Avoid release to the environment.

Wear protective gloves/protective clothing/eye protection/face protection.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.31.2014

Ammonium Hydroxide, ACS Grade

Use personal protective equipment as required.

Do not eat, drink or smoke when using this product.

Wash skin thoroughly after handling.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER or doctor/physician.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Collect spillage.

Specific treatment (see supplemental first aid instructions on this label).

Wash contaminated clothing before reuse.

Store locked up.

Store in a dry place.

Store in a well ventilated place. Keep container tightly closed.

Dispose of contents and container as instructed in Section 13.

Other Non-GHS Classification: None

SECTION 3: Composition/information on ingredients

Ingredients:

| Ingredients: | | |
|---------------------------|-------------------------|-------|
| CAS 1336-21-6 | Ammonium Hydroxide, ACS | <30 % |
| Percentages are by weight | | |

SECTION 4: First aid measures

Description of first aid measures

After inhalation:

Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Seek medical advice if discomfort or irritation persists. If breathing difficult, give oxygen. Give artificial respiration if necessary.

After skin contact:

Wash affected area with soap and water. Rinse/flush exposed skin gently using water for 15-20 minutes. Seek medical advice if discomfort or irritation persists.

After eye contact:

Protect unexposed eye. Remove contact lens(es) if able to do so during rinsing. Immediately flush exposed eye(s) gently using water for 15-20 minutes. Immediately get medical assistance if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual dilute with milk or water. Get medical assistance if irritation, discomfort or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Irritation. Nausea. Headache. Shortness of breath.

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician. Notes to Physician: Treat symptomatically.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.31.2014

Ammonium Hydroxide, ACS Grade

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing agents:

If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

Unsuitable extinguishing agents: None

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors. Thermal decomposition can lead to release of irritating gases and vapors. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Advice for firefighters:

Protective equipment:

Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions):

Move product containers away from fire or keep cool with water spray as a protective measure, where feasible. Use spark-proof tools and explosion-proof equipment.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Transfer to a disposal or recovery container. Avoid contact with eyes, skin, and clothing. Use spark-proof tools and explosion-proof equipment. Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources. Protect from heat. Stop the spill, if possible. Contain spilled material by diking or using inert absorbent.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13.

Methods and material for containment and cleaning up:

If in a laboratory setting, follow Chemical Hygiene Plan procedures. Neutralize with 5% Hydrochloric acid. Let stand over night and decant mixture to drain with excess water. Dispose of remaining solid as normal refuse. Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air. Collect solids in powder form using vacuum with HEPA filter. Ventilate area of spill. Cover spill with mixture of clay, sand, and sodium carbonate or calcium carbonate. Scoop mixture into container and in fume hood, add cold water.

Reference to other sections: None

SECTION 7: Handling and storage

Precautions for safe handling:

Wash hands after handling. Empty containers can still be hazardous since they retain product residue. Follow good hygiene procedures when handling chemical materials. Do not eat, drink, smoke, or use personal products when handling chemical substances. If in a laboratory setting, follow Chemical Hygiene Plan. Use only in well ventilated areas. Avoid contact with eyes, skin, and clothing.

Conditions for safe storage, including any incompatibilities:

Protect from freezing and physical damage. Store below 25 C. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents. Store in cool, dry conditions in well sealed containers. Store with like hazards. Keep container tightly closed.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.31.2014

Ammonium Hydroxide, ACS Grade

SECTION 8: Exposure controls/personal protection



Control parameters:

1336-21-6, Ammonium Hydroxide, ACGIH TLV: 17 mg/m³.
1336-21-6, Ammonium Hydroxide, OSHA PEL: 35 mg/m³.
1336-21-6, Ammonium Hydroxide, OSHA TWA 25 ppm (18 mg/m³) ST 35 ppm (27 mg/m³).
1336-21-6, Ammonium Hydroxide, ACGIH TWA 25 ppm (18 mg/m³) ST 35 ppm (27 mg/m³).

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or dusts (total/respirable) below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Use under a fume hood. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Respiratory protection:

Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable. Local/general exhaust is recommended. If the TLV is exceeded, a full-face cartridge respirator may be worn up to 50 times the TLV or the maximum use concentration specified by the respirator supplier.

Protection of skin:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Eye protection:

Safety glasses with side shields or goggles.

General hygienic measures:

The usual precautionary measures are to be adhered to when handling chemicals. Keep away from food, beverages and feed sources. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases/fumes/dust/mist/vapor/aerosols. Avoid contact with the eyes and skin.

SECTION 9: Physical and chemical properties

| | | | |
|--|-------------------------|---|-------------------------------|
| Appearance (physical state, color): | Clear, colorless liquid | Explosion limit lower: | Not determined |
| | | Explosion limit upper: | Not determined |
| Odor: | Ammonia - like | Vapor pressure at 20°C: | 115 at 20 C |
| Odor threshold: | Not determined | Vapor density: | 3.38 |
| pH-value: | 9(Alkaline) | Relative density: | 0.9 |
| Melting/Freezing point: | - 72 C | Solubilities: | Infinite solubility in water. |
| Boiling point/Boiling range: | 36 C | Partition coefficient (n-octanol/water): | Not determined |

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.31.2014

Ammonium Hydroxide, ACS Grade

| | | | |
|---------------------------------------|--------------------------------|--|--|
| Flash point (closed cup): | Not determined | Auto/Self-ignition temperature: | Not determined |
| Evaporation rate: | Not determined | Decomposition temperature: | Not determined |
| Flammability (solid, gaseous): | Not determined | Viscosity: | a. Kinematic: Not determined b. Dynamic: Not determined |
| Density at 20°C: | 0.9 g/cm ³ at 20 °C | | |

SECTION 10: Stability and reactivity

Reactivity: None

Chemical stability:

No decomposition if used and stored according to specifications.

Possible hazardous reactions: None

Conditions to avoid:

Store away from oxidizing agents, strong acids or bases.

Incompatible materials:

Strong oxidizers, acids, gold, mercury, halogens, silver, calcium hypochlorite bleaches.

Hazardous decomposition products:

Ammonia and nitrogen oxides.

SECTION 11: Toxicological information

Acute Toxicity: No additional information.

Chronic Toxicity: No additional information.

Skin corrosion/irritation: No additional information.

Serious eye damage/irritation: No additional information.

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

Germ cell mutagenicity: No additional information.

Reproductive Toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

SECTION 12: Ecological information

Ecotoxicity:

Fish (acute 1336-21-6), 96 Hr LC50 Pimephales promelas: 8.2 mg/L.

Crustacea (acute 1336-21-6), 48 Hr EC50 water flea: 0.66 mg/L; 48 Hr EC50 Daphnia pulex: 0.66 mg/L.

Ecotoxicity, Very toxic to aquatic life.

Persistence and degradability:

Readily degradable in the environment.

Bioaccumulative potential: No additional information.

Mobility in soil: No additional information.

Other adverse effects: No additional information.

SECTION 13: Disposal considerations

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.31.2014

Ammonium Hydroxide, ACS Grade

Waste disposal recommendations:

Product/containers must not be disposed together with household garbage. Dispose of remaining solid as normal refuse. Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product. Ventilate area of spill. Cover spill with mixture of clay, sand, and sodium carbonate or calcium carbonate. Scoop mixture into container and in fume hood, add cold water. Neutralize with 5% Hydrochloric acid. Let stand over night and decant mixture to drain with excess water.

SECTION 14: Transport information

US DOT

UN Number:

ADR, ADN, DOT, IMDG, IATA

UN2672

Limited Quantity Exception:

None

Bulk:

RQ (if applicable): None

Proper shipping Name: Ammonia Solution.

Hazard Class: 8

Packing Group: III.

Marine Pollutant (if applicable): No

Comments: None

Non Bulk:

RQ (if applicable): None

Proper shipping Name: Ammonia Solution.

Hazard Class: 8

Packing Group: III.

Marine Pollutant (if applicable): No

Comments: None



SECTION 15: Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

1336-21-6 Ammonium Hydroxide.

RCRA (hazardous waste code):

None of the ingredients are listed.

TSCA (Toxic Substances Control Act) :

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

1336-21-6 Ammonium Hydroxide, ACS 1000.

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients are listed.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.31.2014

Ammonium Hydroxide, ACS Grade

Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

Canada

Canadian Domestic Substances List (DSL) :

All ingredients are listed.

SECTION 16: Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

NFPA: 3-0-0

HMIS: 3-0-0

GHS Full Text Phrases: None

Abbreviations and Acronyms:

IMDG International Maritime Code for Dangerous Goods.
PNEC. Predicted No-Effect Concentration (REACH).
CFR Code of Federal Regulations (USA).
SARA Superfund Amendments and Reauthorization Act (USA).
RCRA. Resource Conservation and Recovery Act (USA).
TSCA. Toxic Substances Control Act (USA).
NPRI National Pollutant Release Inventory (Canada).
DOT US Department of Transportation.
IATA International Air Transport Association.
GHS Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH American Conference of Governmental Industrial Hygienists.
CAS Chemical Abstracts Service (division of the American Chemical Society).
NFPA National Fire Protection Association (USA).
HMIS Hazardous Materials Identification System (USA).
WHMIS Workplace Hazardous Materials Information System (Canada).
DNEL Derived No-Effect Level (REACH).

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

Sulfuric Acid, 12.0N

SECTION 1: Identification of the substance/mixture and of the supplier

Product name: Sulfuric Acid, 12.0N

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: KEMSA1692-300ML

Recommended uses of the product and restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific, Inc.
9 Barnhart Drive
Hanover, PA 17331
1-717-632-1291

Supplier Details:

AquaPhoenix Scientific Inc.
9 Barnhart Drive, Hanover PA 17331
(717) 632-1291

Emergency telephone number:

ChemTel: (24-hour) (US and Canada)
1-(800)-255-3924

SECTION 2: Hazards identification

Classification of the substance or mixture:



Health hazard

Carcinogenicity, category 1A



Corrosive

Skin corrosion, category 1A
Serious eye damage, category 1
Corrosive to metals, category 1

Acute hazards to the aquatic environment, category 3

Skin Corrosion 1A.

Carcinogenic 1 (Strong inorganic acid mists/aerosols containing sulfuric acid).

Corrosive to metals. 1.

Eye corrosion 1.

Acute aquatic toxicity 3.

Signal word: Danger

Hazard statements:

May be corrosive to metals.

May cause cancer.

Causes severe skin burns and eye damage.

Causes serious eye damage.

Harmful to aquatic life.

Precautionary statements:

If medical advice is needed have product container or label at hand.

Keep out of reach of children.

Read label before use.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

Sulfuric Acid, 12.0N

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Use personal protective equipment as required.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly after handling.
Do not breathe dust/fume/gas/mist/vapours/spray.
Keep only in original container.
Avoid release to the environment.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
Wash contaminated clothing before reuse.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.
Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.
Specific treatment (see supplemental first aid instructions on this label).
IF exposed or concerned: Get medical advice/attention.
Absorb spillage to prevent material damage.
Store locked up.
Store in a corrosive resistant container with a resistant inner liner.
Dispose of contents/container.

Other Non-GHS Classification: None

SECTION 3: Composition/information on ingredients

Ingredients:

| Ingredients: | | |
|---------------------------|-----------------|----------|
| CAS 7664-93-9 | Sulfuric Acid | 62.008 % |
| CAS 7732-18-5 | Deionized Water | 37.992 % |
| Percentages are by weight | | |

SECTION 4: First aid measures

Description of first aid measures

After inhalation:

Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Provide oxygen if breathing is difficult. Seek immediate medical advice.

After skin contact:

Rinse thoroughly. Rinse/flush exposed area gently using water for at least 30 minutes. Seek immediate medical assistance. Remove contaminated clothing and discard. Neutralize the soaking solution with sodium hydroxide solution.

After eye contact:

Protect unexposed eye. Remove contact lens(es) if able to do so during rinsing. Rinse/flush exposed eye(s) gently using water for at least 30 minutes. Seek immediate medical assistance. Rinse under the eyelids during flushing.

After swallowing:

Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Do not induce

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

Sulfuric Acid, 12.0N

vomiting. Seek immediate medical assistance.

Most important symptoms and effects, both acute and delayed:

Irritation. Nausea. Headache. Shortness of breath. Burning of eyes or skin. Coughing. Strong inorganic acid mists containing sulfuric acid can cause cancer. Lung damage, chronic bronchitis. Damage to teeth and stomach.

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician. Use of soap may assist with neutralization on exposed skin in conjunction with flushing.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing agents:

If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition. Use dry Chemical, foam, or carbon dioxide to extinguish fire.

Unsuitable extinguishing agents:

Do not use water directly on sulfuric acid.

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors. Poisonous sulfur oxides are combustion products. Aerosols or mist may be produced in a fire. Sulfuric acid may ignite combustibles.

Advice for firefighters:

Protective equipment:

Use respiratory protective device against the effects of fumes/dust/aerosol. Wear protective equipment for fire and chemical resistance.

Additional information (precautions):

Containers may explode.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Neutralize with lime or soda ash. Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources. Protect from heat. Stop the spill, if possible. Contain spilled material by diking or using inert absorbent. Transfer to a disposal or recovery container.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13.

Methods and material for containment and cleaning up:

If in a laboratory setting, follow Chemical Hygiene Plan procedures. Always obey local regulations. Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor. Do not use water. Neutralize with lime or soda ash. Add water to form slurry. Decant water to drain with excess water. Dispose of remaining solid as normal refuse.

Reference to other sections: None

SECTION 7: Handling and storage

Precautions for safe handling:

Prevent formation of aerosols. Do not mix with bases. Wash hands after handling. Avoid contact with eyes, skin, and clothing. Follow good hygiene procedures when handling chemical materials. Do not eat, drink, smoke, or use personal products when handling chemical substances. Wear protective clothing and equipment. Do not

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

Sulfuric Acid, 12.0N

handle with incompatibles (see Section 10). Avoid ingestion and inhalation.

Conditions for safe storage, including any incompatibilities:

Protect from freezing. Keep container tightly closed. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents. Store in cool, dry conditions in well sealed containers. Do not store near incompatible materials (see Section 10). Store away from reducing agents.

SECTION 8: Exposure controls/personal protection



Control parameters:

7664-93-9, Sulfuric Acid., OSHA PEL: 1mg/m³.
7664-93-9, Sulfuric Acid., ACGIH TLV: 0.2 mg/m³.

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Use under a fume hood. Ensure eye wash and safety showers are available.

Respiratory protection:

Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable. Use under a fume hood. Respirator with acid gas cartridges.

Protection of skin:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation. Wear protective equipment to prevent contact with skin, eyes, or hair.

Eye protection:

Safety glasses with side shields or goggles. Face shield.

General hygienic measures:

Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.

SECTION 9: Physical and chemical properties

| | | | |
|--|-------------------------|---|--|
| Appearance (physical state, color): | Clear, colorless liquid | Explosion limit lower: | Not determined |
| | | Explosion limit upper: | Not determined |
| Odor: | Odorless | Vapor pressure at 20°C: | Not determined |
| Odor threshold: | Not determined | Vapor density: | Not determined |
| pH-value: | <3 | Relative density: | 1.04 - 1.06 |
| Melting/Freezing point: | Below 0 | Solubilities: | Soluble in water. |
| Boiling point/Boiling range: | Approx 100C | Partition coefficient (n-octanol/water): | Not determined |
| Flash point (closed cup): | Not determined | Auto/Self-ignition temperature: | Not determined |
| Evaporation rate: | Not determined | Decomposition temperature: | Not determined |
| Flammability (solid, gaseous): | Not determined | Viscosity: | a. Kinematic: Not determined b. Dynamic: Not determined |

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

Sulfuric Acid, 12.0N

| | |
|-------------------------|----------------|
| Density at 20°C: | Not determined |
|-------------------------|----------------|

SECTION 10: Stability and reactivity

Reactivity:

Reacts violently with water with evolution of heat. Corrosive to metals.

Chemical stability:

No decomposition if used and stored according to specifications.

Possible hazardous reactions:

Reacts violently or explosively with incompatibles. Reacts with most metals to produce hydrogen gas, which may form explosive mixtures with air.

Conditions to avoid:

Store away from incompatible substances, excess heat.

Incompatible materials:

Organics. Metals. Strong acids. Strong bases. Alcohols. Chlorine. halogenated compounds. Combustible materials. Chlorates. Alkalines. Carbides. Fulminates. Reducing agents. Nitrates. Acetic acid. Oxidizing agents.

Hazardous decomposition products:

Oxides of sulfur. Carcinogenic mists/aerosols. Oxygen.

SECTION 11: Toxicological information

Acute Toxicity: No additional information.

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Rabbit - Extremely corrosive and destructive to tissue. 7664-93-9.

Serious eye damage/irritation:

Rabbit - Corrosive to eyes. 7664-93-9.

Respiratory or skin sensitization: No additional information.

Carcinogenicity:

Strong inorganic acid mists containing sulfuric acid.: IARC Group 1

Germ cell mutagenicity: No additional information.

Reproductive Toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

SECTION 12: Ecological information

Ecotoxicity:

7664-93-9, EC50 - Daphnia magna (Water flea) - 29 mg/l - 24 h.

7664-93-9, LC50 - Gambusia affinis (Mosquito fish) - 42 mg/l - 96 h.

Persistence and degradability:

Not applicable for test method.

Bioaccumulative potential:

Not expected to bio accumulate.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

Sulfuric Acid, 12.0N

Mobility in soil:

Aqueous solution has high mobility in soil.

Other adverse effects:

Concentrated sulfuric acid has moderate acute and chronic toxicity to aquatic life, which is driven by the pH of the aquatic environment, as a result of the presence of the acid. Small quantities will be neutralized by natural alkalinity.

SECTION 13: Disposal considerations

Waste disposal recommendations:

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.

SECTION 14: Transport information

US DOT

UN Number:

ADR, ADN, DOT, IMDG, IATA

2796

Limited Quantity Exception:

None

Bulk:

RQ (if applicable): None

Proper shipping Name: Sulfuric Acid Solution.

Hazard Class: 8

Packing Group: II.

Marine Pollutant (if applicable): No additional information.

Comments: None

Non Bulk:

RQ (if applicable): None

Proper shipping Name: Sulfuric Acid Solution.

Hazard Class: 8

Packing Group: II.

Marine Pollutant (if applicable): No additional information.

Comments: None



SECTION 15: Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Reactive, Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

7664-93-9 Sulfuric acid.

RCRA (hazardous waste code):

None of the ingredients are listed.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

Sulfuric Acid, 12.0N

TSCA (Toxic Substances Control Act) :

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7664-93-9 sulfuric acid 1000 lb.

Proposition 65 (California):

Chemicals known to cause cancer:

7664-93-9 sulfuric acid.

Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

Canada

Canadian Domestic Substances List (DSL) :

All ingredients are listed.

SECTION 16: Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

NFPA: 3-0-0

HMIS: 3-0-2

GHS Full Text Phrases: None

Abbreviations and Acronyms:

IMDG International Maritime Code for Dangerous Goods.
PNEC. Predicted No-Effect Concentration (REACH).
CFR Code of Federal Regulations (USA).
SARA Superfund Amendments and Reauthorization Act (USA).
RCRA. Resource Conservation and Recovery Act (USA).
TSCA. Toxic Substances Control Act (USA).
NPRI National Pollutant Release Inventory (Canada).
DOT US Department of Transportation.
IATA International Air Transport Association.
GHS Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH American Conference of Governmental Industrial Hygienists.

Safety Data Sheet
according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014

| |
|-----------------------------|
| Sulfuric Acid, 12.0N |
|-----------------------------|

CAS Chemical Abstracts Service (division of the American Chemical Society).

NFPA National Fire Protection Association (USA).

HMIS Hazardous Materials Identification System (USA).

WHMIS Workplace Hazardous Materials Information System (Canada).

DNEL Derived No-Effect Level (REACH).