Printing date 06/05/2024 Reviewed on 06/05/2024

1 Identification

· Product identifier

· Trade name: Mixed Metals High Level in 2% HNO₃ & 0.05% HCl

· Article number: HOE044

· Details of the supplier of the safety data sheet

· Manufacturer/Supplier: Aqua Solutions, Inc. 6913 Highway 225 DEER PARK, TX 77536 USA 800-256-2586

· Information department:

Technical Coordinator

Sherman Nelson shermann@aquasolutions.org

· Emergency telephone number: Chemtrec: 800-424-9300 Canutec: 613-996-6666



*

2 Hazard(s) identification

· Classification of the substance or mixture



GHS03 Flame over circle

Oxidizing Liquids 2 H272 May intensify fire; oxidizer.



GHS05 Corrosion

Skin Corrosion 1A H314 Causes severe skin burns and eye damage.

Eye Damage 1 H318 Causes serious eye damage.



GHS07

Acute Toxicity - Oral 4 H302 Harmful if swallowed.

- · Label elements
- · GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
- · Hazard pictograms







GHS03

GHS05

GHS07

- · Signal word Danger
- · Hazard-determining components of labeling:

Nitric Acid

Aluminum Nitrate

(Contd. on page 2)

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Trade name: Mixed Metals High Level in 2% HNO₃ & 0.05% HCl

(Contd. of page 1)

· Hazard statements

May intensify fire; oxidizer.

Harmful if swallowed.

Causes severe skin burns and eye damage.

· Precautionary statements

Keep away from heat.

Keep/Store away from clothing/combustible materials.

Take any precaution to avoid mixing with combustibles.

Do not breathe dusts or mists.

Wash thoroughly after handling.

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

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

If swallowed: Call a poison center/doctor if you feel unwell.

If swallowed: Rinse mouth. Do NOT induce vomiting.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep 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/doctor.

Specific treatment (see on this label).

Wash contaminated clothing before reuse.

In case of fire: Use CO2, powder or water spray to extinguish.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

- · Classification system:
- · NFPA ratings (scale 0 4)



Health = 2Fire = 0Reactivity = 0

· HMIS-ratings (scale 0 - 4)



Health = 2Fire = 0

- · Other hazards
- · Results of PBT and vPvB assessment
- · **PBT**: Not applicable.
- · vPvB: Not applicable.

3 Composition/information on ingredients

- · Chemical characterization: Mixtures
- · Description: Mixture of the substances listed below with nonhazardous additions.

| · Dangerous components: | | | | |
|-------------------------|------------------|--------|--|--|
| CAS: 7697-37-2 | Nitric Acid | 5.074% | | |
| CAS: 7784-27-2 | Aluminum Nitrate | 0.627% | | |

· Table of Nonhazardous Ingredients

CAS: 7732-18-5 Water 94.181%

(Contd. on page 3)

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Trade name: Mixed Metals High Level in 2% HNO₃ & 0.05% HCl

| | (0 | Contd. of page 2) |
|-----------------|--|-------------------|
| CAS: 7647-01-0 | Hydrochloric Acid | 0.056% |
| CAS: 7439-89-6 | Iron Metal | 0.045% |
| CAS: 7789-02-8 | Chromium Nitrate Nonahydrate | 0.008% |
| CAS: 10196-18-6 | Zinc Nitrate, Reagent Grade | 0.005% |
| CAS: 19004-19-4 | Cupric Nitrate Hydrate | 0.004% |
| CAS: 7446-08-4 | selenium dioxide | 0.001% |
| CAS: 13478-00-7 | Nickel Nitrate, Reagent Grade, Crystal | 0.001% |

4 First-aid measures

- · Description of first aid measures
- · General information:

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- · After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- · After skin contact: Immediately wash with water and soap and rinse thoroughly.
- · After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- · After swallowing:

Immediately call a doctor.

Drink copious amounts of water and provide fresh air. Immediately call a doctor.

- · Information for doctor:
- · Most important symptoms and effects, both acute and delayed No further relevant information available.
- $\cdot \textit{Indication of any immediate medical attention and special treatment needed}$

No further relevant information available.

5 Fire-fighting measures

- · Extinguishing media
- · Suitable extinguishing agents: Use fire fighting measures that suit the environment.
- · Special hazards arising from the substance or mixture

During heating or in case of fire poisonous gases are produced.

- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures

Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

· Environmental precautions:

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

· Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Use neutralizing agent.

Dispose contaminated material as waste according to section 13.

Ensure adequate ventilation.

(Contd. on page 4)

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(Contd. of page 3)

· Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

· Protective Action Criteria for Chemicals

| PAC-1: | XV | 0.16 |
|-----------------|--|----------------------|
| | Nitric Acid | 0.16 ppm |
| CAS: 7784-27-2 | Aluminum Nitrate | 83 mg/m ³ |
| CAS: 7647-01-0 | Hydrochloric Acid | 1.8 ppm |
| CAS: 7439-89-6 | Iron Metal | 3.2 mg/m^3 |
| CAS: 10196-18-6 | Zinc Nitrate, Reagent Grade | 27 mg/m³ |
| CAS: 19004-19-4 | Cupric Nitrate Hydrate | 42 mg/m ³ |
| CAS: 7446-08-4 | selenium dioxide | 0.84 mg/m |
| CAS: 13478-00-7 | Nickel Nitrate, Reagent Grade, Crystal | 1.5 mg/m³ |
| PAC-2: | | |
| CAS: 7697-37-2 | Nitric Acid | 24 ppm |
| CAS: 7784-27-2 | Aluminum Nitrate | 920 mg/m |
| CAS: 7647-01-0 | Hydrochloric Acid | 22 ppm |
| CAS: 7439-89-6 | Iron Metal | 35 mg/m ³ |
| CAS: 10196-18-6 | Zinc Nitrate, Reagent Grade | 300 mg/n |
| CAS: 19004-19-4 | Cupric Nitrate Hydrate | 150 mg/m |
| CAS: 7446-08-4 | selenium dioxide | 1.6 mg/m |
| CAS: 13478-00-7 | Nickel Nitrate, Reagent Grade, Crystal | 53 mg/m³ |
| PAC-3: | | |
| CAS: 7697-37-2 | Nitric Acid | 92 ppm |
| CAS: 7784-27-2 | Aluminum Nitrate | 5,500 mg/m |
| CAS: 7647-01-0 | Hydrochloric Acid | 100 ppm |
| CAS: 7439-89-6 | Iron Metal | 150 mg/m^3 |
| CAS: 10196-18-6 | Zinc Nitrate, Reagent Grade | 1,800 mg/m |
| CAS: 19004-19-4 | Cupric Nitrate Hydrate | 240 mg/m³ |
| CAS: 7446-08-4 | selenium dioxide | 9.5 mg/m³ |
| CAS: 13478-00-7 | Nickel Nitrate, Reagent Grade, Crystal | 320 mg/m³ |

7 Handling and storage

- · Handling:
- · Precautions for safe handling

Ensure good ventilation/exhaustion at the workplace.

Prevent formation of aerosols.

- · Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- · Storage:
- · Requirements to be met by storerooms and receptacles: No special requirements.
- · Information about storage in one common storage facility: Not required.
- · Further information about storage conditions: Keep receptacle tightly sealed.

(Contd. on page 5)

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Trade name: Mixed Metals High Level in 2% HNO₃ & 0.05% HCl

(Contd. of page 4)

· Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- · Additional information about design of technical systems: No further data; see section 7.
- · Control parameters
- · Components with limit values that require monitoring at the workplace:

The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.

At this time, the remaining constituent has no known exposure limits.

CAS: 7697-37-2 Nitric Acid

PEL Long-term value: 5 mg/m³, 2 ppm

REL Short-term value: 10 mg/m³, 4 ppm Long-term value: 5 mg/m³, 2 ppm

TLV Short-term value: (4) NIC-0.025* ppm

Long-term value: (2) ppm *inh. fraction + vapor, NIC-A4

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- · General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

(Contd. on page 6)

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Trade name: Mixed Metals High Level in 2% HNO₃& 0.05% HCl

(Contd. of page 5)

· Eye protection:



Tightly sealed goggles

· Body protection: Protective work clothing

| Physical and chemical proper | rties | |
|--------------------------------------|---|--|
| Information on basic physical and | chemical properties | |
| · General Information | | |
| · Appearance: | | |
| Form: | Liquid | |
| Color: | Clear | |
| · Odor: | Odorless | |
| Odor threshold: | Not determined. | |
| pH-value: | Not determined. | |
| Change in condition | | |
| Melting point/Melting range: | Undetermined. | |
| Boiling point/Boiling range: | 83 °C (181.4 °F) | |
| Flash point: | Not applicable. | |
| Flammability (solid, gaseous): | Not applicable. | |
| Decomposition temperature: | Not determined. | |
| Ignition temperature: | Product is not selfigniting. | |
| Danger of explosion: | Product does not present an explosion hazard. | |
| Explosion limits: | | |
| Lower: | Not determined. | |
| Upper: | Not determined. | |
| Vapor pressure at 20 °C (68 °F): | 23 hPa (17.3 mm Hg) | |
| Density at 20 °C (68 °F): | 1.02057 g/cm³ (8.51666 lbs/gal) | |
| Relative density | Not determined. | |
| Vapor density | Not determined. | |
| Evaporation rate | Not determined. | |
| Solubility in / Miscibility with | | |
| Water: | Fully miscible. | |
| Partition coefficient (n-octanol/wat | er): Not determined. | |
| Viscosity: | | |
| Dynamic: | Not determined. | |
| Kinematic: | Not determined. | |
| Solvent content: | | |
| Water: | 94.2 % | |
| VOC content: | 0.00 % | |
| | 0.0 g/l / 0.00 lb/gal | |

(Contd. on page 7)

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Trade name: Mixed Metals High Level in 2% HNO3 & 0.05% HCl

| | | (Contd. of page 6) |
|---------------------|--|--------------------|
| Solids content: | 0.7 % | |
| · Other information | No further relevant information available. | |

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- · Information on toxicological effects
- · Acute toxicity:

| · LD/LC50 | values tha | t are relevant for classification: |
|------------|-------------|------------------------------------|
| ATE (Acu | te Toxicity | Estimate) |
| Oral | LD50 | 586 mg/kg |
| Inhalative | LC50/4h | 59.1 mg/l |

- · Primary irritant effect:
- · on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:

Strong caustic effect.

Strong irritant with the danger of severe eye injury.

- · Sensitization: No sensitizing effects known.
- · Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations: Harmful

Corrosive

Irritant

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· Carcinogenic categories

| · IARC (Internatio | nal Agency for Research on Cancer) | |
|--------------------|--|---|
| CAS: 7446-08-4 | selenium dioxide | 3 |
| CAS: 13478-00-7 | Nickel Nitrate, Reagent Grade, Crystal | 1 |
| , | oxicology Program) | |
| CAS: 13478-00-7 | Nickel Nitrate, Reagent Grade, Crystal | K |
| · OSHA-Ca (Occup | pational Safety & Health Administration) | |
| None of the ingred | lients is listed. | |

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Trade name: Mixed Metals High Level in 2% HNO₃ & 0.05% HCl

(Contd. of page 7)

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- · Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- · Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 2 (Self-assessment): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

 ${\it Must not reach bodies of water or drainage ditch undiluted or unneutralized.}$

Danger to drinking water if even small quantities leak into the ground.

- · Results of PBT and vPvB assessment
- · **PBT**: Not applicable.
- · vPvB: Not applicable.
- · Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- · Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

- · UN-Number
- · DOT, IMDG, IATA UN3264
- · UN proper shipping name
- $\cdot DOT$

Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)

· IMDG, IATA CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid)

- · Transport hazard class(es)
- $\cdot DOT$



· Class 8 Corrosive substances

(Contd. on page 9)

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Trade name: Mixed Metals High Level in 2% HNO₃& 0.05% HCl

| | (Contd. of pag |
|--|---|
| Label | 8 |
| IMDG, IATA | |
| | |
| | |
| Class | 8 Corrosive substances |
| Label | 8 |
| Packing group | |
| DOT, IMDG, IATA | III |
| Environmental hazards: | Not applicable. |
| Special precautions for user | Warning: Corrosive substances |
| Hazard identification number (Kemler code) | : 80 |
| EMS Number: | F- A , S - B |
| Segregation groups | (SGG1) Acids |
| Stowage Category | B |
| Stowage Code | SW2 Clear of living quarters. |
| Transport in bulk according to Annex II of | |
| MARPOL73/78 and the IBC Code | Not applicable. |
| Transport/Additional information: | |
| DOT | |
| Quantity limitations | On passenger aircraft/rail: 1 L |
| • | On cargo aircraft only: 30 L |
| IMDG | |
| Limited quantities (LQ) | 1L |
| Excepted quantities (EQ) | Code: E2 |
| - · · · · · · · | Maximum net quantity per inner packaging: 30 ml |
| | Maximum net quantity per outer packaging: 500 ml |
| UN "Model Regulation": | UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.C. |
| - | (NITRIC ACID), 8, III |

15 Regulatory information

- · Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.
- · Sara

| · Section 355 (extre | emely hazardous substances): |
|----------------------|--------------------------------|
| CAS: 7697-37-2 | Nitric Acid |
| · Section 313 (Spec | ific toxic chemical listings): |
| CAS: 7697-37-2 | Nitric Acid |
| CAS: 7784-27-2 | Aluminum Nitrate |
| CAS: 7789-02-8 | Chromium Nitrate Nonahydrate |
| CAS: 10196-18-6 | Zinc Nitrate, Reagent Grade |
| CAS: 7446-08-4 | selenium dioxide |
| | (Contd. on page 10) |

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Trade name: Mixed Metals High Level in 2% HNO₃ & 0.05% HCl

| | (Contd. of pag |
|--|----------------|
| CAS: 13478-00-7 Nickel Nitrate, Reagent Grade, Crystal | |
| TSCA (Toxic Substances Control Act): | |
| Water | ACTIV |
| Nitric Acid | ACTIV |
| Hydrochloric Acid | ACTIV |
| Iron Metal | ACTIV |
| selenium dioxide | ACTIV |
| Hazardous Air Pollutants | |
| CAS: 7647-01-0 Hydrochloric Acid | |
| CAS: 7446-08-4 selenium dioxide | |
| Proposition 65 | |
| Chemicals known to cause cancer: | |
| CAS: 13478-00-7 Nickel Nitrate, Reagent Grade, Crystal | |
| Chemicals known to cause reproductive toxicity for females: | |
| None of the ingredients is listed. | |
| Chemicals known to cause reproductive toxicity for males: | |
| CAS: 13478-00-7 Nickel Nitrate, Reagent Grade, Crystal | |
| Chemicals known to cause developmental toxicity: | |
| CAS: 13478-00-7 Nickel Nitrate, Reagent Grade, Crystal | |
| Carcinogenic categories | |
| · EPA (Environmental Protection Agency) | |
| CAS: 7446-08-4 selenium dioxide | |
| TLV (Threshold Limit Value) | |
| None of the ingredients is listed. | |
| NIOSH-Ca (National Institute for Occupational Safety and Health) | |

- · GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
- · Hazard pictograms







CAS: 13478-00-7 Nickel Nitrate, Reagent Grade, Crystal

GHS03

GHS05

GHS07

- · Signal word Danger
- · Hazard-determining components of labeling:

Nitric Acid

Aluminum Nitrate

· Hazard statements

May intensify fire; oxidizer.

Harmful if swallowed.

Causes severe skin burns and eye damage.

· Precautionary statements

Keep away from heat.

Keep/Store away from clothing/combustible materials.

(Contd. on page 11)

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Trade name: Mixed Metals High Level in 2% HNO₃ & 0.05% HCl

(Contd. of page 10)

Take any precaution to avoid mixing with combustibles.

Do not breathe dusts or mists.

Wash thoroughly after handling.

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

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

If swallowed: Call a poison center/doctor if you feel unwell.

If swallowed: Rinse mouth. Do NOT induce vomiting.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep 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/doctor.

Specific treatment (see on this label).

Wash contaminated clothing before reuse.

In case of fire: Use CO2, powder or water spray to extinguish.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- · Department issuing SDS: Environment protection department.
- · Contact:

Date of Preparation / Last Revision:

· Date of preparation / last revision

Revision 1.2, 06/05/2024: Reviewed SDS for accuracy. MH/STN

Revision 0.0, 02-12-2016: Creation date for SDS. STN

None

06/05/2024

· Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

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

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

Oxidizing Liquids 2: Oxidizing liquids – Category 2

Acute Toxicity - Oral 4: Acute toxicity – Category 4

Skin Corrosion 1A: Skin corrosion/irritation - Category 1A

Eye Damage 1: Serious eye damage/eye irritation - Category 1

* * Data compared to the previous version altered.

-US