

Safety Data Sheet

acc. to OSHA HCS

Printing date 10/04/2017

Reviewed on 10/04/2017

1 Identification

- **Product identifier**
- **Trade name:** Sulfur Calibration Stock
5,000 ppm as S
- **Article number:** AM097S2
- **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 sherman@aquasolutions.org
- **Emergency telephone number:**
Chemtrec: 800-424-9300
Canutec: 613-996-6666



2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS08 Health hazard

Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.



GHS07

STOT SE 3 H336 May cause drowsiness or dizziness.

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



GHS02



GHS07



GHS08

- **Signal word** Danger
- **Hazard-determining components of labeling:**
Pentane
2,2,4-Trimethylpentane (Iso-Octane)
- **Hazard statements**
Highly flammable liquid and vapor.

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May cause drowsiness or dizziness.

May be fatal if swallowed and enters airways.

· Precautionary statements

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Avoid breathing dust/fume/gas/mist/vapors/spray

Use only outdoors or in a well-ventilated area.

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

IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

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.

Call a POISON CENTER/doctor if you feel unwell.

Do NOT induce vomiting.

In case of fire: Use for extinction: CO₂, powder or water spray.

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

Store in a well-ventilated place. Keep cool.

Store locked up.

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

· Classification system:

· NFPA ratings (scale 0 - 4)



Health = 2

Fire = 4

Reactivity = 0

· HMIS-ratings (scale 0 - 4)



Health = 3

Fire = 4

Reactivity = 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: 109-66-0 | Pentane | 96.0% |
| CAS: 540-84-1 | 2,2,4-Trimethylpentane (Iso-Octane) | 3.178% |

· Table of Nonhazardous Ingredients

| | | |
|---------------|--------------------------------------|--------|
| CAS: 111-31-9 | Hexanethiol 96% | 0.172% |
| CAS: 110-66-7 | Pentanethiol, 98% (n-Amyl Mercaptan) | 0.169% |
| CAS: 109-79-5 | Buthanethiol (Butyl Mercaptan) | 0.165% |
| CAS: 107-03-9 | n-Propanethiol | 0.162% |

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CAS: 75-08-1 | Ethanethiol (Ethyl Mercaptan)

0.154%

4 First-aid measures

- **Description of first aid measures**
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If symptoms persist consult doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:** 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).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **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:**

| | | |
|---------------|-------------------------------------|-----------|
| CAS: 109-66-0 | Pentane | 3000* ppm |
| CAS: 540-84-1 | 2,2,4-Trimethylpentane (Iso-Octane) | 230 ppm |
| CAS: 111-31-9 | Hexanethiol 96% | 0.045 ppm |
| CAS: 109-79-5 | Buthanethiol (Butyl Mercaptan) | 4.5 ppm |
| CAS: 107-03-9 | n-Propanethiol | 0.045 ppm |
| CAS: 75-08-1 | Ethanethiol (Ethyl Mercaptan) | 1.0 ppm |

- **PAC-2:**

| | | |
|---------------|---------|--------------|
| CAS: 109-66-0 | Pentane | 33000*** ppm |
|---------------|---------|--------------|

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| | | |
|---------------|-------------------------------------|---------|
| CAS: 540-84-1 | 2,2,4-Trimethylpentane (Iso-Octane) | 830 ppm |
| CAS: 111-31-9 | Hexanethiol 96% | 0.5 ppm |
| CAS: 109-79-5 | Buthanethiol (Butyl Mercaptan) | 50 ppm |
| CAS: 107-03-9 | n-Propanethiol | 0.5 ppm |
| CAS: 75-08-1 | Ethanethiol (Ethyl Mercaptan) | 120 ppm |

· **PAC-3:**

| | | |
|---------------|-------------------------------------|---------------|
| CAS: 109-66-0 | Pentane | 200000*** ppm |
| CAS: 540-84-1 | 2,2,4-Trimethylpentane (Iso-Octane) | 5000* ppm |
| CAS: 111-31-9 | Hexanethiol 96% | 48 ppm |
| CAS: 109-79-5 | Buthanethiol (Butyl Mercaptan) | 2,500 ppm |
| CAS: 107-03-9 | n-Propanethiol | 320 ppm |
| CAS: 75-08-1 | Ethanethiol (Ethyl Mercaptan) | 360 ppm |

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**
 Keep ignition sources away - Do not smoke.
 Protect against electrostatic charges.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
 Keep receptacle tightly sealed.
 Store in cool, dry conditions in well sealed receptacles.
- **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 item 7.
- **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

| | |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| CAS: 109-66-0 Pentane | |
| PEL | Long-term value: 2950 mg/m ³ , 1000 ppm |
| REL | Long-term value: 350 mg/m ³ , 120 ppm Ceiling limit value: 1800* mg/m ³ , 610* ppm *15-min |
| TLV | Long-term value: 2950 mg/m ³ , 1000 ppm |
| CAS: 540-84-1 2,2,4-Trimethylpentane (Iso-Octane) | |
| PEL | Long-term value: 2350 mg/m ³ , 500 ppm n-Octane only |
| TLV | Long-term value: 1401 mg/m ³ , 300 ppm |

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· **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.

Wash hands before breaks and at the end of work.

· **Breathing equipment:** Not required.

· **Protection of hands:**

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.

· **Eye protection:**



Tightly sealed goggles

· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form: Liquid

Color: Clear

· **Odor:** Slight sulfur

· **Odor threshold:** Not determined.

· **pH-value:** Not determined.

· **Change in condition**

Melting point/Melting range: -129.7 °C (-201 °F)

Boiling point/Boiling range: 36 °C (97 °F)

· **Flash point:** -35 °C (-31 °F)

· **Flammability (solid, gaseous):** Not applicable.

· **Ignition temperature:** 285 °C (545 °F)

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Product is not selfigniting.

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

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| | |
|-----------------------------------------------------------------------------|------------------------|
| · Explosion limits: | |
| Lower: | 1.4 Vol % |
| Upper: | 7.8 Vol % |
| · Vapor pressure at 20 °C (68 °F): 573 hPa (430 mm Hg) | |
| · Density at 20 °C (68 °F): 0.6294 g/cm ³ (5.252 lbs/gal) | |
| · Relative density Not determined. | |
| · Vapor density Not determined. | |
| · Evaporation rate Not determined. | |
| · Solubility in / Miscibility with Water at 20 °C (68 °F): 0.01 g/l | |
| · Partition coefficient (n-octanol/water): Not determined. | |
| · Viscosity: | |
| Dynamic: | Not determined. |
| Kinematic: | Not determined. |
| · Solvent content: | |
| Organic solvents: | 99.2 % |
| VOC content: | 99.2 % |
| | 624.2 g/l / 5.21 lb/gl |
| · Solids content: 0.2 % | |
| · 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 that are relevant for classification: | | |
| ATE (Acute Toxicity Estimate) | | |
| Oral | LD50 | 5208 mg/kg (mouse) |
| Dermal | LD50 | 3125 mg/kg (rabbit) |
| Inhalative | LC50/4 h | 627178 mg/l (rat) |
| CAS: 109-66-0 Pentane | | |
| Oral | LD50 | 5000 mg/kg (mouse) |
| Dermal | LD50 | 3000 mg/kg (rabbit) |

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| | | |
|----------------------------------------------------------|----------|-----------------------|
| Inhalative | LC50/4 h | -4h-364000 mg/l (rat) |
| CAS: 540-84-1 2,2,4-Trimethylpentane (Iso-Octane) | | |
| Dermal | LD50 | ->2000 mg/kg (rat) |
| Inhalative | LC50/4 h | -4h->33.52 mg/l (rat) |
| CAS: 75-08-1 Ethanethiol (Ethyl Mercaptan) | | |
| Oral | LD50 | 682 mg/kg (rat) |
| Inhalative | LC50/4 h | 4420 mg/l (rat) |

- **Primary irritant effect:**

- **on the skin:** No irritant effect.

- **on the eye:** No irritating effect.

- **Sensitization:** No sensitizing effects known.

- **Additional toxicological information:**

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

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

None of the ingredients is listed.

- **NTP (National Toxicology Program)**

None of the ingredients is listed.

- **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

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.

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.

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- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> · UN-Number · DOT, IMDG, IATA | <p style="margin-left: 20px;">UN1993</p> |
| <ul style="list-style-type: none"> · UN proper shipping name · DOT · IMDG · IATA | <p style="margin-left: 20px;">Flammable liquids, n.o.s. (Pentanes) FLAMMABLE LIQUID, N.O.S. (PENTANES, OCTANES, AMYL MERCAPTAN, ETHYL MERCAPTAN), MARINE POLLUTANT FLAMMABLE LIQUID, N.O.S. (PENTANES)</p> |
| <ul style="list-style-type: none"> · Transport hazard class(es) · DOT | <p style="margin-left: 20px;">3</p> |
| <ul style="list-style-type: none"> · Class · Label | <p style="margin-left: 20px;">3 Flammable liquids 3</p> |
| <ul style="list-style-type: none"> · IMDG | <p style="margin-left: 20px;">3</p> |
| <ul style="list-style-type: none"> · Class · Label | <p style="margin-left: 20px;">3 Flammable liquids 3</p> |
| <ul style="list-style-type: none"> · IATA | <p style="margin-left: 20px;">3</p> |
| <ul style="list-style-type: none"> · Class · Label | <p style="margin-left: 20px;">3 Flammable liquids 3</p> |
| <ul style="list-style-type: none"> · Packing group · DOT, IMDG, IATA | <p style="margin-left: 20px;">II</p> |
| <ul style="list-style-type: none"> · Environmental hazards: · Marine pollutant: | <p style="margin-left: 20px;">Product contains environmentally hazardous substances: 2,2,4-Trimethylpentane (Iso-Octane), Pentane Yes Symbol (fish and tree)</p> |
| <ul style="list-style-type: none"> · Special precautions for user · Danger code (Kemler): · EMS Number: · Stowage Category | <p style="margin-left: 20px;">Warning: Flammable liquids 33 F-E,<u>S-E</u> B</p> |

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- | | |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| · 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: 5 L On cargo aircraft only: 60 L |
| <hr style="border-top: 1px dashed black;"/> | |
| · 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 1993 FLAMMABLE LIQUIDS, N.O.S. (PENTANES), 3, II |

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara

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|--------------------------------------------------------|
| · Section 355 (extremely hazardous substances): |
|--------------------------------------------------------|

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|------------------------------------|
| None of the ingredients is listed. |
|------------------------------------|

| |
|----------------------------------------------------------|
| · Section 313 (Specific toxic chemical listings): |
|----------------------------------------------------------|

| |
|------------------------------------|
| None of the ingredients is listed. |
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| |
|-----------------------------------------------|
| · TSCA (Toxic Substances Control Act): |
|-----------------------------------------------|

| |
|-----------------------------|
| All ingredients are listed. |
|-----------------------------|

| |
|-------------------------|
| · Proposition 65 |
|-------------------------|

| |
|-------------------------------------------|
| · Chemicals known to cause cancer: |
|-------------------------------------------|

| |
|------------------------------------|
| None of the ingredients is listed. |
|------------------------------------|

| |
|----------------------------------------------------------------------|
| · Chemicals known to cause reproductive toxicity for females: |
|----------------------------------------------------------------------|

| |
|------------------------------------|
| None of the ingredients is listed. |
|------------------------------------|

| |
|--------------------------------------------------------------------|
| · Chemicals known to cause reproductive toxicity for males: |
|--------------------------------------------------------------------|

| |
|------------------------------------|
| None of the ingredients is listed. |
|------------------------------------|

| |
|-----------------------------------------------------------|
| · Chemicals known to cause developmental toxicity: |
|-----------------------------------------------------------|

| |
|------------------------------------|
| None of the ingredients is listed. |
|------------------------------------|

| |
|----------------------------------|
| · Carcinogenic categories |
|----------------------------------|

| |
|------------------------------------------------|
| · EPA (Environmental Protection Agency) |
|------------------------------------------------|

| | |
|-----------------------------------------------------|----|
| CAS: 540-84-1 2,2,4-Trimethylpentane (Iso-Octane) | II |
|-----------------------------------------------------|----|

| |
|-----------------------------------------------------------|
| · TLV (Threshold Limit Value established by ACGIH) |
|-----------------------------------------------------------|

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|------------------------------------|
| None of the ingredients is listed. |
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| |
|---------------------------------------------------------------------------|
| · NIOSH-Ca (National Institute for Occupational Safety and Health) |
|---------------------------------------------------------------------------|

| |
|------------------------------------|
| None of the ingredients is listed. |
|------------------------------------|

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

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· **Hazard pictograms**



GHS02 GHS07 GHS08

· **Signal word** *Danger*

· **Hazard-determining components of labeling:**

Pentane

2,2,4-Trimethylpentane (Iso-Octane)

· **Hazard statements**

Highly flammable liquid and vapor.

May cause drowsiness or dizziness.

May be fatal if swallowed and enters airways.

· **Precautionary statements**

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Avoid breathing dust/fume/gas/mist/vapors/spray

Use only outdoors or in a well-ventilated area.

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

IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

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.

Call a POISON CENTER/doctor if you feel unwell.

Do NOT induce vomiting.

In case of fire: Use for extinction: CO2, powder or water spray.

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

Store in a well-ventilated place. Keep cool.

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**

Creation date for SDS 02-09-2015. STN

10-04-2017: review SDS for accuracy. STN

10/04/2017 / -

· **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

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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
Flam. Liq. 2: Flammable liquids – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
Asp. Tox. 1: Aspiration hazard – Category 1

US