1 Identification

· Product name
· Trade name: Trimethylaluminum, elec. gr. (99.999+-%Al) PURATREM
· Item number: 98-1955
· CAS Number: 75-24-1
· EC number: 200-853-0
· Index number: 013-004-00-2

· Details of the supplier of the safety data sheet
· Manufacturer/Supplier: Strem Chemicals, Inc.
7 Mulliken Way
NEWBURYPORT, MA 01950
USA
info@strem.com
· Information department: Technical Department
· Emergency telephone number:
  EMERGENCY: CHEMTREC: + 1 (800) 424-9300
  During normal opening times: +1 (978) 499-1600

2 Hazard(s) identification

· Classification of the substance or mixture

  GHS02 Flame
  Pyr. Liq. 1 H250 Catches fire spontaneously if exposed to air.
  Water-react. 1 H260 In contact with water releases flammable gases, which may ignite spontaneously.

  GHS05 Corrosion
  Skin Corr. 1B H314 Causes severe skin burns and eye damage.

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

  GHS02  GHS05

· Signal word Danger
· Hazard-determining components of labeling:
  trimethylaluminium
· Hazard statements
  H250 Catches fire spontaneously if exposed to air.
  H260 In contact with water releases flammable gases, which may ignite spontaneously.

(Contd. on page 2)
Trade name: Trimethylaluminum, elec. gr. (99.999+-%)-Al) PURATREM

H314 Causes severe skin burns and eye damage.

- Precautionary statements
  P231+P232 Handle under inert gas. Protect from moisture.
  P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
  P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P403+P233 Store in a well-ventilated place. Keep container tightly closed.
  P422 Store contents under inert gas.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- Classification system:
  - NFPA ratings (scale 0 - 4)
    Health = 3
    Fire = 4
    Reactivity = 2

  The substance demonstrates unusual reactivity with water.

  - HMIS-ratings (scale 0 - 4)
    Health = 3
    Fire = 4
    Reactivity = 2

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

3 Composition/information on ingredients

- Chemical characterization: Substances
- CAS No. Description
  75-24-1 trimethylaluminium
- Identification number(s)
  - EC number: 200-853-0
  - Index number: 013-004-00-2

4 First-aid measures

- Description of first aid measures
  - General information: Immediately remove any clothing soiled by the product.
  - 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: 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.
Trade name: Trimethylaluminum, elec. gr. (99.999+%-Al) PURATREM

42.0

· Indication of any immediate medical attention and special treatment needed
  No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
  · Suitable extinguishing agents:
    Sand. Do not use water.
    CO2, sand, extinguishing powder. Do not use water.
  · For safety reasons unsuitable extinguishing agents: Water
  · 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: Prevent seepage into sewage system, workpits and cellars.
· 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 item 13.
  · Ensure adequate ventilation.
  · Do not flush with water or aqueous cleansing agents
· 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.

7 Handling and storage

· Precautions for safe handling
  · Ensure good ventilation/exhaustion at the workplace.
  · Open and handle receptacle with care.
  · Prevent formation of aerosols.
· Information about protection against explosions and fires:
  · Keep sources away - Do not smoke.
  · Protect against electrostatic charges.
  · 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.
      · Store in cool, dry conditions in well sealed receptacles.
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:**
    | Substance | REL Long-term value: 2 mg/m³ as Al |
    |-----------|-----------------------------------|
    | 75-24-1 trimethylaluminium    |                                  |
    |                      | TLV Long-term value: 1* mg/m³ as Al;*as repirable fraction |

- **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.
      - Store protective clothing separately.
      - 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.
      - **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**
9 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
  - Appearance:
    - Form: Liquid
    - Color: Colorless
  - Odor: Odorless
  - Odor threshold: Not determined.
  - pH-value: Not determined.

- Change in condition
  - Melting point/Melting range: 15.4 °C (60 °F)
  - Boiling point/Boiling range: 127 °C (261 °F)

- Flash point: -17 °C (1 °F)
- Flammability (solid, gaseous): Not determined.
- Ignition temperature: PYRO °C
- Decomposition temperature: Not determined.
- Auto igniting: Spontaneously flammable in air.
- Danger of explosion: Not determined.

- Explosion limits:
  - Lower: Not determined.
  - Upper: Not determined.

- Vapor pressure at 20 °C (68 °F): 9mm hPa (7mm mm Hg)

- Density at 20 °C (68 °F):
  - Not determined.
- Relative density
- Vapor density Not determined.
- Evaporation rate Not determined.

- Solubility in / Miscibility with
  - Water: Not miscible or difficult to mix.

- Partition coefficient (n-octanol/water): Not determined.

- Viscosity:
  - Dynamic: Not determined.
  - Kinematic: Not determined.

- Solvent content:
  - Organic solvents: 0.0 %
  - VOC content: 0.0 g/l / 0.00 lb/gl

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.
11 Toxicological information

- Information on toxicological effects
  - Acute toxicity:
  - Primary irritant effect:
    - on the skin: Caustic effect on skin and mucous membranes.
    - on the eye: Strong caustic effect.
  - Sensitization: No sensitizing effects known.
  - Additional toxicological information:
    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 (International Agency for Research on Cancer)
    Substance is not listed.
  - NTP (National Toxicology Program)
    Substance is not listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    Substance is not 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: Must not reach bodies of water or drainage ditch undiluted or unneutralized.
    - 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.
### 14 Transport information

- **UN-Number**
  - DOT, IMDG, IATA: UN3394

- **UN proper shipping name**
  - DOT, IATA: Organometallic substance, liquid, pyrophoric, water-reactive
  - IMDG: ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE

- **Transport hazard class(es)**
  - DOT
    - Class: 4.2 Substances liable to spontaneous combustion
    - Label: 4.2, 4.3
  - IMDG
    - Class: 4.2 Substances liable to spontaneous combustion
    - Label: 4.2/4.3
  - IATA
    - Class: 4.2 Substances liable to spontaneous combustion
    - Label: 4.2 (4.3)

- **Packing group**
  - DOT, IMDG, IATA: I

- **Environmental hazards:**
  - Marine pollutant: No

- **Special precautions for user**
  - Not applicable.

- **EMS Number:**
  - F-G,S-M

- **Stowage Category**
  - D

- **Handling Code**
  - H1 Keep as dry as reasonably practicable

- **Segregation Code**
  - SG26 In addition: from goods of classes 2.1 and 3 when stowed on deck of a containership a minimum distance of two container spaces athwartship shall be maintained, when stowed on ro-ro ships a distance of 6 m athwartship shall be maintained.
  - SG35 Stow "separated from" acids.
  - SG63 Stow "separated longitudinally by an intervening complete compartment or hold from" Class 1.

- **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
  - Not applicable.
Trade name: Trimethylaluminum, elec. gr. (99.999+%-%-Al) PURATREM

· Transport/Additional information:
  · DOT
    · Quantity limitations
      On passenger aircraft/rail: Forbidden
      On cargo aircraft only: Forbidden
  · IMDG
    · Limited quantities (LQ)
      0
    · Excepted quantities (EQ)
      Code: E0
      Not permitted as Excepted Quantity
  · UN "Model Regulation":
    UN 3394 ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE, 4.2 (4.3), I

15 Regulatory information

· Safety, health and environmental regulations/legislation specific for the substance or mixture
  · Sara
    · Section 355 (extremely hazardous substances):
      Substance is not listed.
    · Section 313 (Specific toxic chemical listings):
      Substance is not listed.
    · TSCA (Toxic Substances Control Act):
      Substance is listed.
    · Proposition 65
      · Chemicals known to cause cancer:
        Substance is not listed.
      · Chemicals known to cause reproductive toxicity for females:
        Substance is not listed.
      · Chemicals known to cause reproductive toxicity for males:
        Substance is not listed.
      · Chemicals known to cause developmental toxicity:
        Substance is not listed.
    · Carcinogenic categories
      · EPA (Environmental Protection Agency)
        Substance is not listed.
      · TLV (Threshold Limit Value established by ACGIH)
        Substance is not listed.
      · NIOSH-Ca (National Institute for Occupational Safety and Health)
        Substance is not listed.
    · GHS label elements
      The substance is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms

GHS02  GHS05

· Signal word Danger

· Hazard-determining components of labeling:
trimethylaluminium

· Hazard statements
H250 Catches fire spontaneously if exposed to air.
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H314 Causes severe skin burns and eye damage.

· Precautionary statements
P231+P232 Handle under inert gas. Protect from moisture.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
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P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P422 Store contents under inert gas.
P501 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: Technical Department.
· Contact: Technical Director
· Date of preparation / last revision 08/01/2016 /
· 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
EINECS: European Inventory of Existing Commercial 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)
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
Pyr. Liq. 1: Pyrophoric Liquids, Hazard Category 1
Water-react. 1: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 1
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B