SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: Triphenylphosphine

Stock number: 14112

CAS Number: 603-35-0

EC number: 210-036-0

1.2 Relevant identified uses of the substance or mixture and uses advised against.

Identified use: SU24 Scientific research and development

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Thermo Fisher (Kandel) GmbH
Zeppelinstr. 7b
76185 Karlsruhe / Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300
Email: tech@alfa.com
www.alfa.com
Informing department: Product safety Tel + +049 (0) 7275 988687-0

1.4 Emergency telephone number:

Carechem 24: +44 (o) 1235 239 670 (Multi-language emergency number)
Poison Information Center Mainz
www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

GHS08 health hazard

STOT RE 2 H373 May cause damage to the central nervous system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Skin Sens. 1 H317 May cause an allergic skin reaction.
Other hazards that do not result in classification No information known.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008

The substance is classified and labelled according to the CLP regulation.

Hazard pictograms

GHS07 GHS08

Signal word Warning

Hazard statements:
H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H373 May cause damage to the central nervous system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

Precautionary statements:
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P370 Use protective gloves/eye protection/face protection.
P335 If breathed in: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Substances

CAS# Designation:
803-35-0 Triphenylphosphine

Concentration: ≤100%

Identification number(s):
EC number: 210-036-0

SECTION 4: First aid measures

4.1 Description of first aid measures

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
Seek immediate medical advice.

After skin contact

Instantly wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult doctor.
Seek immediate medical advice.

After swallowing

Seek medical treatment.

4.2 Most important symptoms and effects, both acute and delayed

Harmful if swallowed.
May cause an allergic skin reaction.
May cause damage to the central nervous system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

4.3 Indication of any immediate medical attention and special treatment needed

No further relevant information available.

(Contd. on page 2)
**SECTION 5: Firefighting measures**

5.1 Extinguishing media
Suitable extinguishing agents: CO2, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.

5.2 Special hazards arising from the substance or mixture
- If this product is involved in a fire, the following can be released:
  - Carbon monoxide and carbon dioxide
  - Hydrogen phosphide
  - Phosphorus oxides

5.3 Advice for firefighters
- Protective equipment:
  - Wear self-contained breathing apparatus.
  - Wear full protective suit.

**SECTION 6: Accidental release measures**

6.1 Personal precautions, protective equipment and emergency procedures
- Wear protective equipment. Keep unprotected persons away.
- Ensure good ventilation.

6.2 Environmental precautions:
- Do not allow material to be released to the environment without proper governmental permits.

6.3 Methods and material for containment and cleaning up:
- Dispose of contaminated material as waste according to section 13.

**SECTION 7: Handling and storage**

7.1 Precautions for safe handling
- Keep containers tightly sealed.
- Store in cool, dry place in tightly closed containers.
- Ensure good ventilation/exhaustion at the workplace.
- Prevent formation of dust.

7.2 Conditions for safe storage, including any incompatibilities
- Storage requirements to be met by storerooms and containers: No special requirements.
- Information about storage in one common storage facility:
  - Do not store together with acids.
  - Store away from oxidising agents.

7.3 Specific end use(s):
- No further relevant information available.

**SECTION 8: Exposure controls/personal protection**

Additional information about design of technical systems:
- Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

8.1 Control parameters

Components with critical values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Code</th>
<th>Compound</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>603-35-0</td>
<td>Triphenylphosphine (100.0%)</td>
<td>&gt;5 E mg/m³</td>
<td>AGW (Germany) Long-term value: 5 E mg/m³</td>
</tr>
</tbody>
</table>

Additional information: No data

8.2 Exposure controls

Personal protective equipment
- General protective and hygienic measures:
  - The usual precautionary measures should be adhered to in handling the chemicals.
  - Keep away from foodstuffs, beverages and food.
  - Instantly remove any soiled and impregnated garments.
  - Wash hands during breaks and at the end of the work.

Breathing equipment:
- Use breathing protection with high concentrations.
- Recommended filter device for short term use:
  - Use a respirator with type P100 (USA) or P3 (EN 143) cartridges as a backup to engineering controls.

Protection of hands:
- Check protective gloves prior to each use for their proper condition.
- 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.
- Material of gloves: Nitrile rubber, NBR.

Penetration time of glove material (in minutes) 480
- Glove thickness: 0.11 mm
- Eye protection: Safety glasses with side shields / NIOSH (US) or EN 166(EU)
- Body protection: Protective work clothing.

**SECTION 9: Physical and chemical properties**

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in condition</td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>79-81 °C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>360 °C</td>
</tr>
<tr>
<td>Sublimation temperature / start:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Flash point:</td>
<td>181 °C</td>
</tr>
<tr>
<td>Inflammability (solid, gaseous)</td>
<td>Not determined</td>
</tr>
<tr>
<td>Ignition temperature:</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

(Contd. on page 3)
Trade name Triphenylphosphine

44.0 Decomposition temperature: Not determined
Self-inflammability: Not determined.
Explosive properties:
Critical values for explosion:
Lower: Not determined
Upper: Not determined
Steam pressure: Not applicable.
Density at 20 °C 1.2 g/cm³
Relative density Not determined.
Vapour density Not applicable.
Evaporation rate Not applicable.
Solubility in / Miscibility with
Water: Insoluble
Partition coefficient: n-octanol/water: Not determined.
Viscosity:
dynamic: Not applicable.
kinematic: Not applicable.
9.2 Other information No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity No information known.
10.2 Chemical stability Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.
10.3 Possibility of hazardous reactions Reacts with strong oxidising agents
10.4 Conditions to avoid No further relevant information available.
10.5 Incompatible materials:
Acids
Oxidising agents
Carbon monoxide and carbon dioxide
Phosphorus oxides (e.g. P2O5)
Hydrogen phosphide

SECTION 11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity
Harmful if swallowed.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.
Harmful if swallowed.
LD/LC50 values that are relevant for classification:
Oral LD50 700 mg/kg (rat)
Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: May cause irritation
Respiratory or skin sensitisation
May cause an allergic skin reaction.
May cause an allergic skin reaction.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Germ cell mutagenicity: No effects known.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Germ cell mutagenicity: No effects known.
Specific target organ system toxicity - repeated exposure:
May cause damage to the central nervous system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.
Specific target organ system toxicity - single exposure: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

SECTION 12: Ecological information

12.1 Toxicity
Aquatic toxicity: No further relevant information available.
12.2 Persistence and degradability No further relevant information available.
12.3 Bioaccumulative potential No further relevant information available.
12.4 Mobility in soil No further relevant information available.
Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.
Water hazard class 1 (Self-assessment): slightly hazardous for water.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.
12.5 Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Recommendation
Hand over to disposers of hazardous waste.
Must be specially treated under adherence to official regulations.
Consult state, local or national regulations for proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

UN-Number
ADR, ADN, IMDG, IATA Not applicable
14.2 UN proper shipping name
ADR, ADN, IMDG, IATA Not applicable
SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Australian Inventory of Chemical Substances Substance is listed.
Standard for the Uniform Scheduling of Medicines and Poisons Substance is not listed.
Directive 2012/18/EU
Named dangerous substances - ANNEX I Substance is not listed.
National regulations
Information about limitation of use:
Employment restrictions concerning young persons must be observed.
For use only by technically qualified individuals.
Classification according to VbF: Not applicable
Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
ELINCS (European List of Notified Chemical Substances) Substance is not listed.
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. Substance is not listed.
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed.

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

SECTION 16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Abbreviations and acronyms:
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
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
ATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
LA: Chemical Abstracts Service (division of the American Chemical Society)
VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
LD50: Lethal dose, 50 percent
LC50: Lethal concentration, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety and Health Administration (USA)
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Acute Tox: 4: Acute toxicity – Category 4
Skin Sens. 1: Skin sensitisation – Category 1
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2