1 Identification of substance:

Product details:
Product name: Tannic acid
Stock number: A17022
L04483
Manufacturer/Supplier: Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency information:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Tannic acid (CAS# 1401-55-4), 100%
Identification number(s):
EINECS Number: 215-753-2

3 Hazards identification

Hazard description: Not applicable
Information pertaining to particular dangers for man and environment Not applicable
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Health (acute effects) = 1
Flammability = 1
Reactivity = 1

GHS label elements Void

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact
Immediately 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 a doctor.

After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide

Protective equipment: Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation

(Contd. on page 2)
Material Safety Data Sheet
acc. to OSHA and ANSI

Product name: Tannic acid

(Contd. of page 1)

Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collecting:
Ensure adequate ventilation.

Additional information:
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

Handling
Information for safe handling:
Handle under dry protective gas.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.

Information about protection against explosions and fires:
Dust can combine with air to form an explosive mixture.

Storage
Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:
Store away from oxidizing agents.
Store away from air.
Store in the dark.

Further information about storage conditions:
Store under dry inert gas.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Protect from exposure to light.
This product is air sensitive.

8 Exposure controls and 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.

Components with limit values that require monitoring at the workplace: Not required.

Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands: Impervious gloves

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Powder</td>
</tr>
<tr>
<td>Color</td>
<td>Brown</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
</tbody>
</table>

Change in condition

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range</td>
<td>218°C (424°F) (dec)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>Not determined</td>
</tr>
<tr>
<td>Sublimation temperature / start</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

Flash point:
199°C (390°F)

Ignition temperature:
526°C (979°F)

Decomposition temperature:
Not determined

Danger of explosion:
Product does not present an explosion hazard.

(Contd. on page 3)
Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 06/16/2009 Reviewed on 06/02/2009

Product name: Tannic acid

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.

Materials to be avoided:
Oxidizing agents
Air
Light

Dangerous reactions: No dangerous reactions known

Dangerous products of decomposition: Carbon monoxide and carbon dioxide

11 Toxicological information

Acute toxicity:

| LD/LC50 values that are relevant for classification: |
|-----------------|-----------------|-----------------|-----------------|
| Oral | LD50 | 2000 mg/kg (mouse) |
|      |      | 2260 mg/kg (rat)    |
|      |      | 5000 mg/kg (rabbit)  |
| LDLo | 200 mg/kg (rat)     |

Primary irritant effect:
- on the skin: May cause irritation
- on the eye: May cause irritation

Sensitization: No sensitizing effects known.

Other information (about experimental toxicology):
- Reproductive effects have been observed on tests with laboratory animals.
- Carcinogenic effects have been observed on tests with laboratory animals.

Subacute to chronic toxicity:
- Subacute to chronic toxicity:
  - Ingestion of tannic acid may cause gastrointestinal discomfort. Contact with open wounds may promote absorption and systemic effects. May damage liver and kidneys. RTECS reports reproductive, mutagenic, tumorigenic and carcinogenic effects in laboratory animals.

Additional toxicological information:
- To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
- IARC-3: Not classifiable as to carcinogenicity to humans.
- The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.

12 Ecological information:

General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation: Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
14 Transport information

Not a hazardous material for transportation.

<table>
<thead>
<tr>
<th>DOT regulations:</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard class:</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Land transport ADR/RID (cross-border)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR/RID class:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maritime transport IMDG:</th>
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</thead>
<tbody>
<tr>
<td>IMDG Class:</td>
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<table>
<thead>
<tr>
<th>Air transport ICAO-TI and IATA-DGR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICAO/IATA Class:</td>
</tr>
</tbody>
</table>

Transport/Additional information: Not dangerous according to the above specifications.

15 Regulations

Product related hazard informations:
Observe the general safety regulations when handling chemicals

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

Information about limitation of use: For use only by technically qualified individuals.

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 Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.

Contact: Zachariah Holt

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)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
WHO: Globally Harmonized System of Classification and Labelling of Chemicals
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent