Material Safety Data Sheet
1,2-Bis(diphenylphosphino)ethane

MSDS# 55389

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,2-Bis(diphenylphosphino)ethane
Catalog Numbers: AC147910000, AC147910010, AC147910100, AC147910500
Synonyms: Ethylenebis(diphenylphosphine)

Company Identification: Acros Organics BVBA
Janssen Pharmaceuticaal 3a
2440 Geel, Belgium

Company Identification: (USA)
Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call:
800-ACROS-01
For information in Europe, call:
+32 14 57 52 11
Emergency Number, Europe:
+32 14 57 52 99
Emergency Number US:
201-796-7100
CHEMTREC Phone Number, US:
800-424-9300
CHEMTREC Phone Number, Europe:
703-527-3887

Section 2 - Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>1663-45-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name:</td>
<td>1,2-Bis(diphenylphosphino)ethane</td>
</tr>
<tr>
<td>%:</td>
<td>&gt;98</td>
</tr>
<tr>
<td>EINECS#:</td>
<td>216-769-2</td>
</tr>
</tbody>
</table>

Hazard Symbols: XI

Risk Phrases: 36/37/38

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Warning! Causes eye, skin, and respiratory tract irritation. Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.
Skin: Causes skin irritation. May be absorbed through intact skin.
Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.
Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing
Contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dangerous fire hazard in the form of dust when exposed to heat or flame.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Autoignition Temperature: Not available.
Flash Point: Not available
Explosion Limits: Not available
Explosion Limits: Not available

NFPA Rating: health: 2; flammability: 1; instability: 1;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Storage: Store in a cool, dry place. Store in a tightly closed container. Storage under a nitrogen blanket has been recommended.

Section 8 - Exposure Controls, Personal Protection

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2-Bis(diphenylphosphino)ethane</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: 1,2-Bis(diphenylphosphino)ethane: None listed

Engineering Controls:
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a Respirators: NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Section 9 - Physical and Chemical Properties

Physical State: Crystals
- Color: white to off-white
- Odor: Not available
- pH: Not available
- Vapor Pressure: Not available
- Vapor Density: Not available
- Evaporation Rate: Not available
- Viscosity: Not available
- Boiling Point: Not available

Freezing/Melting Point: 138 - 142 deg C
- Decomposition Temperature: Not available
- Solubility in water: Not available

Specific Gravity/Density:
- Molecular Formula: C26H24P2
- Molecular Weight: 398.41

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive.
Conditions to Avoid: Dust generation, exposure to air, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Phosphine, carbon monoxide, oxides of phosphorus, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#: CAS# 1663-45-2: None listed
LD50/LC50: RTECS: Not available.
Carcinogenicity: 1,2-Bis(diphenylphosphino)ethane - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other: The toxicological properties have not been fully investigated.

Section 12 - Ecological Information

Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
- Shipping Name: Not regulated.
- Hazard Class:
- UN Number:
- Packing Group:

Canada TDG
- Shipping Name: Not regulated as a hazardous material
- Hazard Class:
- UN Number:
- Packing Group:

Section 15 - Regulatory Information

European/International Regulations
- European Labeling in Accordance with EC Directives
  - Hazard Symbols: XI
  - Risk Phrases:
    - R 36/37/38 Irritating to eyes, respiratory system and skin.
Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)
CAS# 1663-45-2: Not available

Canada
CAS# 1663-45-2 is listed on Canada's NDSL List
Canadian WHMIS Classifications: D2B
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
CAS# 1663-45-2 is not listed on Canada's Ingredient Disclosure List.

US Federal
TSCA
CAS# 1663-45-2 is listed on the TSCA Inventory.

Section 16 - Other Information
MSDS Creation Date: 3/16/1998
Revision #7 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

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