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Material Safety Data Sheet  
**Diisobutylaluminum hydride, 20 wt.% solution in toluene**  
MSDS# 80179

Section 1 - Chemical Product and Company Identification

MSDS Name: Diisobutylaluminum hydride, 20 wt.% solution in toluene  
Catalog Numbers: AC201080000, AC201081000, AC201084000  
Synonyms: DIBAL-H.  
Company Identification: Acros Organics BVBA  
Janssen Pharmaceuticaal 3a  
2440 Geel, Belgium  
One Reagent Lane  
Fair Lawn, NJ 07410

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

CAS#: 108-88-3  
Chemical Name: Toluene  
%: 80  
EINECS#: 203-625-9  
Hazard Symbols: F XN  
Risk Phrases: 11 20  
CAS#: 1191-15-7  
Chemical Name: Diisobutylaluminum hydride  
%: 20  
EINECS#: 214-729-9  
Hazard Symbols: F C  
Risk Phrases: 14/15 17 35

Text for R-phrases: see Section 16  
Hazard Symbols:  
XN F C  
Risk Phrases:  
11 14/15 20 35 63 67

Section 3 - Hazards Identification  
EMERGENCY OVERVIEW

Danger! Flammable liquid and vapor. May cause central nervous system effects. Causes eye and skin burns. May cause liver and kidney damage. Harmful or fatal if swallowed. Vapor harmful. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. Reacts violently and/or explosively with water, steam or moisture.  
Target Organs: Kidneys, central nervous system, liver.  
Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause liver and kidney damage. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May be harmful if swallowed. May cause central nervous system effects.

Inhalation: May cause liver and kidney damage. Causes chemical burns to the respiratory tract. Aspiration may lead to pulmonary edema. Vapors may cause dizziness or suffocation. May cause central, peripheral, and autonomic nervous system effects. May cause hypotension, depressed cardiac output, and bradycardia.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. May cause liver and kidney damage.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4

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cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician:

Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:

Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. May burn with invisible flame. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Water Reactive. Material will react with water and may release a flammable and/or toxic gas. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Flammable liquid and vapor. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Will be easily ignited by heat, sparks or flame. Containers may explode if exposed to fire.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Water may be ineffective. Water may spread fire. If water is the only media available, use in flooding amounts. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.

Autoignition Temperature: 480 deg C ( 896.00 deg F)

Flash Point: > 4.4 deg C ( > 39.92 deg F)

Explosion Limits: Lower: 1.2 (approx)

Explosion Limits: Upper: 7.1 (approx)

NFPA Rating:

health: 3; flammability: 3; instability: 1;

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Remove all sources of ignition. Isolate area and deny entry. Provide ventilation. Do not expose spill to water. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling:

Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Do not allow water to get into the container because of violent reaction. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep from contact with moist air and steam.

Storage:

Keep away from heat, sparks, and flame. Keep away from heat and flame. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Refrigerator/flammables. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Toluene	50 ppm; Skin - potential significant contribution to overall exposure by the cutaneous route	100 ppm TWA; 375 mg/m <sup>3</sup> TWA 500 ppm IDLH	200 ppm TWA; 300 ppm Ceiling

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Diisobutylaluminum hydride	none listed	none listed	none listed
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OSHA Vacated PELs:

Toluene:  
100 ppm TWA; 375 mg/m3 TWA  
Diisobutylaluminum hydride:  
None listed

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 minimize contact with skin.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid  
Color: colorless  
Odor: None reported.  
pH: Not available  
Vapor Pressure: Not available  
Vapor Density: >3.1  
Evaporation Rate: Not available  
Viscosity: Not available  
Boiling Point: > 110 deg C (> 230.00&F)  
Freezing/Melting Point: Not available  
Decomposition Temperature: Not available  
Solubility in water: Insoluble  
Specific Gravity/Density: .8580g/cm3  
Molecular Formula: Mixture  
Molecular Weight:

Section 10 - Stability and Reactivity

Chemical Stability:

Stable under normal temperatures and pressures. Combines vigorously and explosively with water.

Conditions to Avoid:

Incompatible materials, ignition sources, dust generation, exposure to air, excess heat, strong oxidants, exposure to moist air or water, mechanical shock.

Incompatibilities with Other Materials

Strong oxidizing agents, acids, alcohols, bromine trifluoride, halogenated organics (e.g. dibromomethane, hexachlorobenzene, methyl chloride, trichloroethylene), dinitrogen tetraoxide, tetranitromethane, uranium hexafluoride.

Hazardous Decomposition Products

Hydrogen chloride, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, aluminum oxide.

Hazardous Polymerization

Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 108-88-3: XS5250000

CAS# 1191-15-7: BD0710000

LD50/LC50:

RTECS: CAS# 108-88-3: Draize test, rabbit, eye: 870 ug  
Mild; Draize test, rabbit, eye: 2 mg/24H Severe; Draize test, rabbit, skin: 435 mg Mild; Draize test, rabbit, skin: 500 mg  
Moderate; Draize test, rabbit, skin: 20 mg/24H Moderate;  
Inhalation, mouse: LC50 = 400 ppm/24H; Inhalation, mouse: LC50 = 30000 mg/m3/2H; Inhalation, mouse: LC50 = 19900 mg/m3/7H;  
Inhalation, mouse: LC50 = 10000 mg/m3; Inhalation, rat: LC50 = 49 gm/m3/4H; Oral, rat: LD50 = 636 mg/kg; Skin, rabbit: LD50 = 14100 ul/kg;

RTECS: CAS# 1191-15-7:

Carcinogenicity:

Toluene -

IARC: Group 3 (not classifiable)

Diisobutylaluminum hydride -

Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology:

Not available

Teratogenicity:

In an epidemiologic study of toluene and pregnancy, occupational exposures to toluene were said to be associated with an increased incidence of renal, urinary, gastrointestinal, and cardiac anomalies. Fetotoxicity (reduced fetal weight), behavioural effects (effects on learning and memory) and hearing loss (in males) were observed in the offspring of rats exposed by inhalation to toluene, in the absence of maternal toxicity.

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Reproductive:

Many reports of reproductive effects of toluene abuse or heavy occupational exposure are confounded by mixed solvent exposure or fetal alcohol syndrome. Women exposed to toluene in lab work had a 4.7-fold increased risk of spontaneous abortions.

Neurotoxicity:

Not available

Mutagenicity:

Not available

Other:

See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity:

Not available

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 108-88-3: waste number U220.

Section 14 - Transport Information

US DOT

Shipping Name: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE,  
Hazard Class: 4.3  
UN Number: UN3399  
Packing Group: I

Canada TDG

Shipping Name:  
Hazard Class: Not available  
UN Number:  
Packing Group:

USA RQ: CAS# 108-88-3: 1000 lb final RQ; 454 kg final RQ

Section 15 - Regulatory Information

US Federal

TSCA

CAS# 108-88-3 is listed on the TSCA Inventory.

CAS# 1191-15-7 is listed on the TSCA Inventory.

Health & Safety Reporting List

CAS# 108-88-3: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 108-88-3: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 108-88-3: acute, flammable.

Section 313

This material contains Toluene (CAS# 108-88-3, 80%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

CAS# 108-88-3 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 108-88-3 is listed as a Hazardous Substance under the CWA.

CAS# 108-88-3 is listed as a Priority Pollutant under the Clean Water Act.

Act.

CAS# 108-88-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

STATE

Toluene can be found on the following state right to know lists:  
California, New Jersey, Pennsylvania, Minnesota, Massachusetts.  
Diisobutylaluminum hydride can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

WARNING: This product contains Toluene, a chemical known to the state of California to cause birth defects or other reproductive harm.

California No Significant Risk Level.

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN F C

Risk Phrases:

R 11 Highly flammable.  
R 14/15 Reacts violently with water liberating extremely flammable gases.  
R 20 Harmful by inhalation.  
R 35 Causes severe burns.  
R 63 Possible risk of harm to the unborn child.

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R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.  
S 23 Do not inhale gas/fumes/vapour/spray.  
S 25 Avoid contact with eyes.  
S 29 Do not empty into drains.  
S 30 Never add water to this product.  
S 33 Take precautionary measures against static discharges.  
S 36 Wear suitable protective clothing.  
S 43A In case of fire, use dry chemical (never use water).

WGK (Water Danger/Protection)

CAS# 108-88-3: 2  
CAS# 1191-15-7: 2

Canada

CAS# 108-88-3 is listed on Canada's DSL List  
CAS# 1191-15-7 is listed on Canada's DSL List  
Canadian WHMIS Classifications: Not available  
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# 108-88-3 is listed on Canada's Ingredient Disclosure List  
CAS# 1191-15-7 is not listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date:

5/20/1999

Revision #5 Date

10/03/2005

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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Health

