



## CP2MG SSG (BIS CYCLOPENTADIENYL MAGNESIUM)

### 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

<b>Product name</b> CP2MG SSG (BIS CYCLOPENTADIENYL MAGNESIUM)	<b>Chemical description</b> Bis(cyclopentadienyl)magnesium
<b>Synonym</b> CP2MG Select Semiconductor Grade	<b>Chemical formula</b> (C5 H5)2 Mg
<b>CAS number</b> 1284-72-6	<b>Chemical family</b> Magnesium alky
<b>Supplier</b> Akzo Nobel Polymer Chemicals LLC 300 South Riverside Plaza Chicago, IL 60606 USA	
<b>Medical/Handling Emergency</b> + 1-914-693-6946 Dobbs Ferry, NY USA	<b>Transportation Emergency</b> CHEMTREC - USA: 1-800-424-9300 CANUTEC - CANADA: 1-613-996-6666
<b>Product use</b> Semiconductors	<b>Product/technical Information</b> 1-800-828-7929
<b>Date of first issue</b> - -	<b>Date of last issue / Revision #</b> 10-20-2000 / 1.00

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	Percentage(s)	CAS number
Bis(cyclopentadienyl)magnesium (Cp2Mg)	100.00	1284-72-6

### 3. HAZARDS IDENTIFICATION

<p><b>Emergency overview</b>          White crystals.          DANGER!          EXTREMELY FLAMMABLE. CATCHES FIRE IF EXPOSED TO AIR.          CAUSES SKIN AND EYE BURNS.          REACTS VIOLENTLY WITH WATER.          Metal alkyls are pyrophoric. The metal alkyl reacts spontaneously with air and/or moisture resulting in ignition. In case of fire, reignition of the metal alkyl may occur after the fire has been extinguished.</p>
<p><b>Health effects</b>          Skin and eye contact are the primary routes of exposure to this product.          Inhalation of the metal alkyl in this product is unlikely due to the highly reactive nature of the metal alkyl with air and its low vapor pressure.          This material will react with moisture in or on the skin to produce thermal burns.          This product will react with moisture in the eyes to produce severe thermal burns.          Ingestion will result in burning of the mouth, throat and any part of the gastrointestinal system with which the material comes in contact. Nausea and vomiting may occur.</p>

<b>Carcinogenicity</b>	
<b>Description</b>	<b>Applicable</b>
IARC	no
NTP	no



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OSHA	no
ACGIH	no

### 4. FIRST AID MEASURES

#### Inhalation

Remove victim to fresh air while protecting yourself from exposure with an appropriate respirator. Remove any contaminated clothing to prevent further inhalation exposure. Use gloves to avoid contaminating yourself. If not breathing, clear victim's airway and start artificial respiration. Avoid inhaling expired air. Artificial respiration may be supplemented by the use of a bag-mask respirator or manually triggered oxygen supply capable of delivering one liter per second or more. If victim is breathing, supplemental oxygen may be given from a demand-type or continuous-flow inhaler, preferably with a physician's advice. Monitor breathing and pulse. If victim stops breathing, restart artificial respiration. If heart has stopped, begin cardiopulmonary resuscitation immediately. Keep person warm and at rest. Get medical attention immediately.

#### Skin

Immediately, without delay, very gently blot excess chemical from skin while wearing impervious gloves and air tight safety goggles. If victim is wearing air tight safety goggles, do not remove them. Take care not to contaminate the victim's healthy skin and eyes. Wash all affected areas with plenty of water for at least 15 minutes. Do not break open blisters or remove skin. If clothing is stuck to the skin after flushing with water, do not remove it. Do not attempt to neutralize with chemical agents. Wash or discard contaminated clothing and shoes. Obtain medical advice immediately.

#### Eye

Immediately flush eyes with large quantities of running water for a minimum of 15 minutes. If the victim is wearing contact lenses, remove them. Take care not to contaminate the victim's healthy skin and eyes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids. DO NOT let victim rub eye(s). Do not attempt to neutralize with chemical agents. Get medical attention immediately. Oils or ointments should not be used at this time. Continue flushing for an additional 15 minutes if a physician is not immediately available.

#### Ingestion

Do NOT induce vomiting. Call a physician or a poison control center immediately. Give victim plenty of water to drink. Never give anything by mouth to an unconscious or convulsing person. Get medical attention immediately.

#### Note to physician

There are no data available that address medical conditions that are generally recognized as being aggravated by exposure to this product.

Attending physician should treat exposed patients symptomatically. Treat thermal burns, if present. Flush eyes with buffered or plain irrigating solutions. If any ulceration or conjunctival injury is present, have an ophthalmologist examine the patient.

### 5. FIRE-FIGHTING MEASURES

<b>Flash point</b> Pyrophoric! (ignites in air.)	<b>Autoignition temperature</b> Ignites spontaneously in air
<b>Flash Method</b> N/A	<b>Explosion limits</b> lower: N/D upper: N/D
<b>Extinguishing media</b> THE MOST EFFECTIVE FIRE EXTINGUISHING AGENT IS DRY CHEMICAL POWDER PRESSURIZED WITH NITROGEN. Vermiculite or dry sand may also be used. CAUTION: REIGNITION MAY OCCUR. DO NOT USE FOAM, WATER (except as explained below), CARBON TETRACHLORIDE OR CHLOROBROMOMETHANE extinguishing agents as product either reacts violently or liberates toxic fumes and vapors on contact with these agents.	



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### Fire fighting procedures

Protecting against fire by strict adherence to safe operating procedures and proper equipment are the best ways to minimize the possibility of fire damage. Immediate action should be taken to confine the fire. All lines and equipment which could contribute to the fire should be shut off.

Standard fireman's bunker gear is recommended for fighting metal alkyl fires. If the fire cannot be controlled with extinguishing agents, keep a safe distance, protect adjacent property and allow burn until consumed.

Human exposure must be prevented and nonessential personnel evacuated from the immediate area.

Breathing vapors from metal alkyl/hydrocarbon fires should be avoided by using proper respiratory equipment.

A NIOSH approved, positive-pressure/pressure demand, air-supplied, full-face respirator should be used.

### Fire and explosion hazards

Metal alkyls are pyrophoric. The metal alkyl reacts spontaneously with air and/or moisture resulting in ignition. In case of fire, reignition of the metal alkyl may occur after the fire has been extinguished.

This material reacts with air, water and compounds containing active hydrogen such as alcohols and acids.

Compounds containing oxygen or organic halide may react upon contact with this product.

Do not cut, grind, drill or weld on or near the container (even empty) of this product because an explosion may result. Keep away from heat, sparks and flame.

### Hazardous products of combustion

Products of complete combustion are carbon dioxide, water and magnesium oxide. Additionally, products of incomplete combustion may include carbon monoxide, elemental carbon and hydrocarbons (alkanes and alkenes).

### NFPA ratings

Hazard	Rating
Health	3
Flammability	3
Reactivity	3
Other	-W

## 6. ACCIDENTAL RELEASE MEASURES

### Methods for cleaning up

Appropriate personal protective equipment (PPE) should be worn while working with spilled material. Block off source of spill. Spilled material will likely give off smoke and fumes. Ignition may occur immediately.

Spill may be washed away cautiously with large quantities of water. Use water spray to reduce vapors.

CAUTION: Water may cause ignition/ reignition to occur. Dike water for later disposal. Do not allow contaminated water to enter waterways.

## 7. HANDLING AND STORAGE

### Handling

Electrically grounded tanks and containers should always be used as should non-sparking, electrically grounded hand tools and appliances. Ground or bond to ground all vessels when transferring to prevent the accumulation of static electricity. See National Electric Code.

### Storage

Store under an inert atmosphere. Nitrogen with less than 5 ppm each moisture and oxygen is recommended.

Containers should be stored in a cool, well-ventilated area away from flammable materials and sources of heat.

Exercise due caution to prevent damage or leakage from the container.

### Maximum storage temperature

not determined

### General comments

Under inert conditions the product is not corrosive to metals commonly used in construction. Some plastics and elastomers may be attacked. Contact Akzo Nobel Polymer Chemicals LLC for specific recommendations regarding suitable materials for use with this product.



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### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Respiratory protection

This material is normally handled under nitrogen and closed process conditions. In an emergency where adequate ventilation is not available and conditions could generate fume, mist or aerosol, inhalation must be prevented through the use of NIOSH-approved organic vapor/ acid gas respirators with dust, mist and fume filters to reduce potential for exposure. Where exposure potential necessitates a higher level of protection, use a NIOSH-approved, positive-pressure/ pressure-demand, air-supplied respirator.

When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the workshift) to assure breakthrough exposure does not occur.

#### Skin protection

Skin contact must be prevented through the use of fire-retardant clothing. During sampling, disconnecting lines or opening connections, additional protective outerwear including a full-face shield, impervious gloves, aluminized suit, a hard hat, steel toed safety shoes that cover the ankles and chemical safety glasses should also be worn.

#### Eye protection

Because eye contact with this product may cause severe and possibly permanent damage, chemical goggles and/or a full face shield must be worn whenever handling this product.

#### Ventilation protection

This material is normally handled under closed process conditions.

#### Other information

This product should not be used until all personnel handling it have been thoroughly trained. Contact Akzo Nobel Polymer Chemicals LLC, Chicago, IL. Additional information on safety and handling of organometallics is available in the Akzo Nobel Polymer Chemicals LLC brochure on metal alkyls.

During the development of safe handling procedures, consideration should be given to the need for cleaning of equipment and piping systems to render them nonhazardous before maintenance and repair activities are performed. Waste resulting from these procedures should be handled in an environmentally safe manner.

All food and smoking materials should be kept in a separate area away from the storage/use location. Eating, drinking and smoking should be prohibited in areas where there is a potential for exposure to this material. Before eating, hands and face should be thoroughly washed.

Safety showers, with quick opening valves which stay open, and eye wash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freezeups in cold weather.

#### Applicable exposure limits

Other than any exposure limits which may be displayed in Section 8, there are no other known exposure limits applicable to this product.

Agency	Value/Unit of measurement
PEL = Permissible Exposure Limit TLV = Threshold Limit Value TWA = Time Weighted Average STEL = Short Term Exposure Limit CEIL = Ceiling Exposure Limit REL = Recommended Exposure Limit WEEL = Workplace Environmental Exposure Limit IDLH = Immediate Dangerous to Life and Health	

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance and Odor</b> White crystals.	<b>pH value</b> not determined
<b>Odor threshold (ppm)</b> not determined	<b>Relative vapor density (air=1)</b> not determined



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<b>Volatile %</b> approx. 100 % by weight	<b>Vapor pressure (mm Hg)</b> approx. 0.043 @ 25 C
<b>Boiling point/range</b> > 572.00 °F 300.00 °C @ 760 mm Hg (Decomposes)	<b>Evaporation rate</b> not determined
<b>Melting point/range</b> 348.80 °F 176.00 °C	
<b>Cloud point</b> not determined	<b>Pour point</b> not determined
<b>Flash point</b> Pyrophoric! (ignites in air.)	<b>Solubility in water</b> Reacts violently
<b>Flash method</b> N/A	<b>Solubility in other solvents</b> Miscible in sat hydrocarbons
<b>Autoignition temperature</b> Ignites spontaneously in air	
<b>Specific Gravity/Density</b> not determined	<b>Partition coefficient n-octanol/water</b> not determined
<b>Bulk density</b> not determined	
	<b>Explosion limits</b> lower: N/D upper: N/D

## 10. STABILITY AND REACTIVITY

<b>Stability</b> This product is stable when stored under a dry, inert atmosphere and away from heat. Nitrogen containing less than 5 ppm each moisture and oxygen is recommended. This product is not sensitive to impact.
<b>Incompatibilities</b> This product may react violently with air, water, and compounds containing active hydrogen such as alcohols and acids. Compounds containing oxygen or organic halide may react vigorously upon contact with the product.
<b>Polymerization</b> Hazardous polymerization is not expected to occur.
<b>Decomposition</b> Magnesium alkyls from Akzo Nobel Polymer Chemicals LLC are thermally stable products. Most show little or no decomposition at temperatures at least up to 140 C (284 F). Products of thermal decomposition include magnesium hydride and olefins.
<b>Conditions to avoid</b> Avoid contact with incompatible material, excessive heat and flames.

## 11. TOXICOLOGICAL INFORMATION

<b>Oral LD50</b>	Ingestion toxicity data are not available for this product.
<b>Dermal LD50</b>	Dermal toxicity data are not available for this product.
<b>Inhalation LC50</b>	Inhalation toxicity data are not available for this product.
<b>Skin</b>	Chronic dermal exposure effects for this product are not known. Skin contact with this product will cause severe chemical burns.



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<b>Eye</b>	The acute eye effects of this product have not been determined. However, severe chemical and thermal burns can occur and may cause permanent eye damage.
<b>Chronic toxicity/carcinogenicity</b>	<p>Chronic ingestion effects of this product are not known. Ingestion will result in burns of the mouth, throat, esophagus and digestive tract.</p> <p>Chronic inhalation exposure effects for this product are not known.</p> <p>The carcinogenic/mutagenic properties of this product are not known.</p> <p>The reproductive toxicity of this product is not known.</p> <p>The neurotoxic effects of this product are not known.</p> <p>Overexposure to this product may affect the skin, eyes and respiratory system.</p>
<b>Other toxicological information</b>	No other toxic effects for this product are known.

### 12. ECOLOGICAL INFORMATION

<b>Ecotoxicological information</b>	The ecological toxicity of this product is not known.
<b>Bioaccumulation</b>	Chemical fate information on this product is not known.
<b>Other information</b>	Other ecological information on this product is not known.

### 13. DISPOSAL CONSIDERATIONS

<p><b>Waste disposal in accordance with regulations</b></p> <p>Incineration by controlled feed of air and product is a suitable disposal procedure. Alternately, deactivation can be achieved by diluting the product with hydrocarbon (heptane, etc.) to less than 5 weight percent metal alkyl concentration and treating the hydrocarbon solution with water under a nitrogen atmosphere in a vented and agitated container. Always add the diluted metal alkyl solution to a large excess of water. Allow for the generation of heat and flammable hydrocarbons when treating with water. Conduct water treatment in the absence of air to avoid possible ignition of flammable material. The products from hydrolysis are hydrocarbons and magnesium oxide.</p> <p>Consult RCRA hazardous waste regulations prior to deactivation for potential treatment permitting considerations.</p> <p>Should the unused product become a waste material, it would meet the characteristics of an ignitable and reactive waste per 40 CFR 261, Subpart C. It is the responsibility of the waste generator to determine if his wastes are hazardous by characteristics or listing.</p> <p>Note: A technical bulletin (No. 95-90) is available from Akzo Nobel Polymer Chemicals LLC describing details of disposal of laboratory quantities of metal alkyls.</p>
<p><b>Container disposal</b></p> <p>Bubbler cylinders containing residue are returnable to Akzo Nobel Polymer Chemicals LLC, 730 Battleground Road, Deer Park, TX 77536. Return shipments of containers are to be in compliance with DOT regulations.</p>



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### 14. TRANSPORT INFORMATION

Shipping description	METAL ALKYLs, WATER-REACTIVE, N.O.S. (BIS(CYCLOPENTADIENYL)MAGNESIUM) 4.2; UN2003; I  North American Emergency Response Guide NO. 135
Required labels	Primary Label: SPONTANEOUSLY COMBUSTIBLE Subsidiary Label: DANGEROUS WHEN WET
Environmentally hazardous substance	This product does not contain an environmentally hazardous substance per 49 CFR 172.101, Appendix A.

### 15. REGULATORY INFORMATION

Products and/or components listed below are subject to the following:

Hazard classes	
Description	Applicable
HMIS Hazard Rating Source	HMIS
HMIS Health	3
HMIS Flammability	3
HMIS Reactivity	3
WHMIS Hazard Class	B-6; D-2B; E; F

#### Other regulatory information

Bis(cyclopentadienyl)magnesium is on the TSCA inventory.

### 16. OTHER INFORMATION

#### Other information

No other information is available.

#### Created by

PRODUCT SAFETY 914/674-5000

The information in this material safety data sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable as of the date of publication. However, no warranty is made as to the accuracy of and/or sufficiency of such information and/or suggestions as to the merchantability or fitness of the product for any particular purpose, or that any suggested use will not infringe any patent. Nothing in here shall be construed as granting or extending any license under any patent. Buyer must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the date on this document is more than three years old, call to make certain that this sheet is current.