Standard Operating Procedure

**Isopropylmagnesium chloride, 2.0 M THF**

*This is an SOP template and is not complete until: 1) lab specific information is entered into the box below 2) lab specific protocol/procedure is added to the protocol/procedure section and   
3) SOP has been signed and dated by the PI and relevant lab personnel.*

Print a copy and insert into your   
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.   
Refer to instructions for assistance.

|  |  |
| --- | --- |
| **Department:** | Click here to enter text. |
| **Date SOP was written:** | Click here to enter a date. |
| **Date SOP was approved by PI/lab supervisor:** | Click here to enter a date. |
| **Principal Investigator:** | Click here to enter text. |
| **Internal Lab Safety Coordinator/Lab Manager:** | Click here to enter text. |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | Click here to enter text. |
| **Emergency Contact:** | Click here to enter text. |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | Click here to enter text. |
| *(Building/Room Number)* |

**Type of SOP:** ☐ Process ☒Hazardous Chemical ☐ Hazardous Class

**Purpose**

Isopropylmagnesium chloride is a Grignard reagent that is highly flammable. Contact with water releases flammable gases. It is considered a pyrophoric liquid. It may also form explosive peroxides. It is harmful if ingested or absorbed through the skin and may be harmful if inhaled. It causes burns by all exposure routes. It is a suspected carcinogen. Isopropylmagnesium chloride is mainly used in organic synthesis to attach an isopropyl group onto carbonyl groups. It can also be used as a strong base in aprotic solvents.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 1068-55-9; THF: 109-99-9

Class: **Flammable, pyrophoric, water reactive, harmful by ingestion, corrosive, carcinogen, peroxide former**

Molecular Formula: C3H7ClMg in C4H8O

Form (physical state): Liquid

Color: Brown

Boiling point: N/A

**Potential Hazards/Toxicity**

Isopropylmagnesium chloride is a highly flammable liquid and vapor that is both light and moisture-sensitive. Contact with water releases flammable gases. It is a pyrophoric liquid. Handle under inert gas and protect from moisture. May form explosive peroxides. It is harmful if ingested or absorbed through the skin and may be harmful if inhaled. May penetrate intact skin. Causes burns by all exposure routes. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Causes skin and eye burns with severe damage. Vapors may cause drowsiness or dizziness. Symptoms of exposure include irritation, central nervous system depression, nausea, headache, coughing, difficulty breathing, unconsciousness, and coma. Prolonged exposure may cause conjunctivitis, dermatitis, and damage to liver, kidneys, and lungs. May cause cancer. THF has a permissible exposure limit (PEL) of 590 mg/m3.

**Personal Protective Equipment (PPE)**

**Respirator Protection**

Use a full-face respirator with multi-purpose combination (US) respirator cartridges.

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
* As PPE in the event of a chemical spill clean-up process

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Hand Protection**

Handle with gloves. Fluorinated rubber gloves are recommended. Note: THF permeates standard nitrile gloves in less than 1 minute. Minimize contact with THF.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with isopropylmagnesium chloride, 2.0 M THF.

Refer to glove selection chart from the links below:

<http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf>

OR

<http://www.allsafetyproducts.biz/page/74172>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

**Eye Protection**

ANSI approved, tight-fitting glasses/goggles. Face shields are recommended.

**Skin and Body Protection**

Flame-resistant lab coat preferably made of antistatic material, long pants, closed-toe shoes.

**Hygiene Measures**

Avoid contact with skin, eyes, and clothing. Wash hands before breaks and after handling.

**Engineering Controls**

Isopropylmagnesium chloride should be used in a glove box or in a closed system in a certified chemical fume hood.

**First Aid Procedures**

**If inhaled**

Move person into fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult a physician.

**In case of skin contact**

Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing. Consult a physician.

**In case of eye contact**

Flush eyes with plenty of water for at least 15 minutes lifting upper and lower eyelids and removing contact lenses. Consult a physician. Continue rinsing eyes during transport to hospital.

**If swallowed**

Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**Special Handling and Storage Requirements**

**Precautions for safe handling:** Avoid contact with skin, eyes, and clothing. Avoid inhalation and ingestion. Use spark-proof tools and explosion-proof equipment. Provide adequate ventilation. Keep away from heat and other sources of ignition- No smoking. Prevent build-up of electrostatic charge.

**Conditions for safe storage:** Keep container tightly closed in a cool, dry, and well-ventilated area. Opened containers must be carefully resealed and kept upright to prevent leakage. Never allow contact with water. Handle and store under inert gas. Store protected from sunlight. Store in flammables and corrosives area. Container should be dated when opened and tested periodically for peroxides. Avoid acids, alcohols, oxidizing agents, and oxygen.

Always date peroxide forming chemicals with the date of receipt and the date of opening the chemical. Please completely use or dispose of the chemical within one year of the opening/receipt date.

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

Wearing proper PPE, place spills under inert atmosphere. Cover with dry sand or other non-combustible material. Do not flush with water. Dispose of the used chemical and contaminated disposables as hazardous waste.

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure (Add lab specific Protocol/Procedure here)**

Click here to enter text.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with isopropylmagnesium chloride, 2.0 M THF, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

I have read and understand the content of this SOP:

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| **Name** | **Signature** | **Date** |
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