

# Safety Data Sheets (SDS)

## Internet Research Activity

### Participant Guide

#### Description and Estimated Time to Complete

This is a research activity to locate specific Safety Data Sheets (SDS) that are relevant to microsystems fabrication. Such SDSs can be located at various sites on Internet. From these SDSs, you will extract specific information and interpret that information for its relevance to maintaining your safety and the safety of fellow employees in the workplace.

This activity allows you to demonstrate your ability to locate a SDS and interpret the information found within it.

Estimated time to complete:

Allow at least 2 hours

#### Introduction

In order to work safely in a facility that fabricates MEMS devices, you must understand the purpose of a SDS and how to extract information about various chemicals. Such facilities use many hazardous materials that could be harmful to your health and the environment if not handled properly or if the required safety measures are not followed.

A Safety Data Sheet (SDS) contains information on the hazards associated with a particular chemical, handling information, emergency procedures for spills or human contact, and data associated with its flammability and reactivity. Before storing, handling or working with a chemical in any manner, you should become familiar with the information provided in the chemical's SDS.

#### Dependencies

Knowledge of the terminology and acronyms associated with hazardous materials would be beneficial. Such terms can be found in the SDS HyperGlossary (<http://www.ilpi.com/msds/ref/index.html>).

**Resource:** SCME [Safety Data Sheets PK](#)



Chemical Safety LLC

Product and Company Information

**Boron Trichloride**  
Product ID: Boron Trichloride  
Date of SDS: 01/10/2014  
Technical Review Date: 08/1/2014  
Manufacturer: Chemical Safety LLC  
555 Our Chemical St.  
Safety, NC 00099-3333  
Emergency Phone #: (111) 000-2222  
Trade Names/Synonyms: BCL3, Boron Chloride, TriChloroboron  
Chemical Family: non-metallic, halides



Chemical Safety LLC

Safety Data Sheet – BCL3

Hazard(s) Identification  
NFPA Ratings: Health 3 Fire 0 Reactivity 2  
Color: colorless  
Physical Form: fuming liquid, gas  
Odor: pungent odor  
May cause respiratory tract burns, skin burns, eye burns, mucous membrane burns.  
Containers may rupture or explode is exposed to heat.  
Releases toxic, corrosive, flammable or explosive gas

## Documentation

Create a written report documenting the information collected for this activity. Your report should include the following:

- The information extracted for each step of the procedure
- Explanations and justifications when required
- Post-Activity Questions with answers

## SDS Internet Research

When you are working with chemicals, it is important that you know how to locate a SDS, extract information from it, understand the meaning of the information extracted, and know how to use the information.

## Description

Use the Internet to locate the required SDS's and information for the following chemicals.

### ***SDS for HexaMethylDiSilazane (HMDS)***

Extract the following information:

- SDS Source (Manufacturer and URL)
- Ingredients and respective percents (%)
- Primary health hazard(s)
- Chemical characteristic(s)
- First aid measures for eye contact with HMDS
- First responder's responsibility to an HMDS fire
- Flashpoint temperature
- Toxicity limits
- Safety procedure for filling an HMDS bottle at the equipment. (*Write in your own words*)

### ***SDS for Hydrofluoric Acid***

Extract the following information:

- SDS Source (Manufacturer and URL)
- Ingredients and respective percents (%)
- First responder's responsibility to a co-worker being splashed with HF
- Effects of HF when mixed with water
- Required PPE when working with HF
- Flammability characteristics
- Safety procedure for working with any concentration of HF (*Write in your own words*)

### ***SDS for TetraMethylAmmoniumHydroxide (TMAH)***

Extract the following information:

- SDS Source (Manufacturer and URL)
- Ingredients and percents (%)
- Chemical characteristics (i.e. corrosive, poison, mutagen, etc.)
- Flammability characteristics
- Physical properties of TMAH
- Procedure for responding to a possible TMAH spill (*Write in your own words*)

### ***Comparison of the three SDSs***

Using the three SDSs from the previous steps, complete the following table. Indicate with a check mark which characteristic applies to which chemical(s).

<b>Characteristics</b>	<b>HMDS</b>	<b>HF</b>	<b>TMAH</b>
Carcinogen			
Flammable			
Poison			
Strong acid			
Strong base			
Flashpoint > 200 C			
Reactive with water			
Soluble in water			
Requires safety glasses			

**Table 1: SDS Comparison**

## Post-Activity Questions

1. What does SDS stand for?
2. List ten (10) requirements for a SDS.
3. Under which section would one find the flashpoint for a chemical? What happens when a chemical reaches its flashpoint?
4. Under which section would one find the maximum amount of concentration of a chemical that a worker may be exposed to under OSHA regulations? What is this called?
5. Under which section would one find a chemical's ability to be mixed with water or other chemicals?
6. In what fabrication process is HMDS used in microsystems manufacturing?
7. What is an application of HF in microsystems fabrication?
8. Where is TMAH used in microsystems fabrication?

## Final Documentation

Create a written report documenting the information collected for this activity.

Your report should include the following:

- The information extracted for each step of the procedure
- Explanations and justifications when required
- Post-Activity Questions with answers

## References

- SCME Safety Data Sheet
- OSHA ([www.osha.gov](http://www.osha.gov) )
- Safety Data Sheets (<http://www.ilpi.com/SDS/index.html> )

## Disclaimer

The information contained herein is considered to be true and accurate; however the Southwest Center for Microsystems Education (SCME) makes no guarantees concerning the authenticity of any statement. SCME accepts no liability for the content of this unit, or for the consequences of any actions taken on the basis of the information provided.

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