

## What is Chemistry?

Chemistry is everywhere around us and our surroundings are composed of chemicals.

ex: orange juice  $\Rightarrow$  citric acid and water

toast  $\Rightarrow$  carbohydrates and starches

breathing  $\Rightarrow$  combination of gases  $O_2$ ,  $N_2$ , etc



Most people think that Chemistry is just a study of chemicals but in reality, it is much more.

<http://www.youtube.com/watch?v=4SbyQ9eVP7Q>

Chemistry is " the study of matter, its properties and the changes and transformations that it undergoes."

Matter: anything that has mass and takes up space.

Matter has two kinds of properties:

1. Chemical Properties - behavior of substances under certain conditions.
2. Physical Properties - physical (look) characteristics of substances.

## Chemical Safety

Some chemical are safe, while others are not.

There are many chemicals in the world today that could present major health hazards if we do NOT treat them carefully.

To accomplish some form of safety in dealing with chemicals, people are provided information on potentially hazardous products.

# WHMIS

Workplace Hazardous Materials Information System

WHMIS consists of standardized symbols which are labelled on items that are considered a danger to human health.

Here's one you may recognize.....



**There are 8 WHMIS symbols.....YOU are responsible for remembering them.....**

**WHMIS symbols are generally used in the workplace environment.**



Compressed  
Gas



Flammable



Oxidizer



Poisonous



Toxic



Biohazard



Corrosive



Reactive

But what about the home?

Certainly there are chemicals there as well.....

### Hazardous Household Product Symbols ( HHPS )

These are easier for chemical safety  
in the home.....remember.....drain cleaner, windex,  
antifreeze and fertilizers are household chemicals too.

4 Important HHPS symbols to be aware of:

1. Poisonous
2. Flammable
3. Explosive
4. Corrosive

There are varying degrees of danger. These dangers  
fall into 3 categories.....

caution ⇒ warning ⇒ danger

Poison Flammable Explosive Corrosive

Danger



Warning



Caution



### MSDS - Material Safety Data Sheet

Any chemicals that are purchased nowadays, come with an identity sheet called an MSDS sheet.

These sheets have very detailed information on the chemical purchased , in 9 categories of info.....see handout.

Nice for emergency personnel to know what they're dealing with when dangerous chemicals are on-hand.

SECTION I		NAME		24 HOUR EMERGENCY ASSISTANCE								
Product	PHENOLPHTHALEIN POWDER	<p>CHEMTREC 800-424-9300 Day 714-234-7177</p> <p>NFPA HAZARD RATING</p> <table border="1"> <tr> <td>HEALTH</td> <td>FLAMM.</td> <td>REACTIVITY</td> <td>TOXICITY</td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> </table>	HEALTH	FLAMM.	REACTIVITY	TOXICITY	0	1	2	3	Health	1
HEALTH	FLAMM.		REACTIVITY	TOXICITY								
0	1		2	3								
Chemical Synonyms	3,3'-Bis(p-tert-butylphenyl)propane		Fire	1								
Formula	$C_{24}H_{30}O_2$	Reactivity	1									
Unit Size	up to 2.5 Kg											
C.A.S. No.	77-06-6											
SECTION II		INGREDIENTS OF MIXTURES										
Principal Component(s)		%	TLV Units									
Phenolphthalein, powder		100%	None established									
CAUTION! MAY BE HARMFUL IF SWALLOWED.												
SECTION III		PHYSICAL DATA										
Melting Point (°F)	259-263°C (499-505°F)	Specific Gravity (H <sub>2</sub> O = 1)	1.217 (20°C/68°F)									
Boiling Point (°F)	Decomposes	Refractive Index (n <sub>D</sub> 20)	N/A									
Vapor Pressure (mm Hg)	Negligible as solid	Evaporative Rate	N/A									
Vapor Density (Air = 1)	HEA											
Solubility in Water	0.001% at 25°C											
Appearance & Odor	White powder; no odor											





