HAZWOPER TRAINING
FOR THE PROFESSIONAL

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PURPOSE OF THE STANDARD

- TO MAKE SURE ALL HAZARDOUS CHEMICALS PRODUCED, IMPORTED, OR USED IN THE U.S. ARE EVALUATED AND THAT THIS INFORMATION IS PASSED ON TO EMPLOYERS AND EMPLOYEES THAT MAY BE EFFECTED.

REQUIREMENTS OF EMPLOYER

- USE ONLY LABELED PRODUCTS.
- OBTAIN AND PROVIDE MSDS ON ALL PRODUCTS.
- PROVIDE TRAINING TO ALL EMPLOYEES.
- HAVE A WRITTEN HAZCOM PROGRAM.
  - LABELS ON CONTAINERS OR OTHER POSTERS,PLACARDS OR WARNINGS

MSDS CONTENTS

- MANUFACTUER'S INFORMATION.
- HAZARDOUS INGREDIENTS / PRODUCT IDENITY.
- PHYSICAL/ CHEMICAL CHARACTERISTICS.
- FIRE / EXPLOSION DATA.
- HEALTH HAZARD DATA.
- PRECAUTIONS/ SAFE HANDLING.
- CONTROL MEASURES.

MANUFACTURER'S INFORMATION

- WHO MAKES IT.
- HOW TO CONTACT THE COMPANY.
  - ADDRESS, PHONE NUMBER, ETC..
- DATE PREPARED.

HAZARDOUS INGREDIENTS

- CHEMICAL INFORMATION
- PEL- PERMISSABLE EXPOSURE LIMITS/ **LAW !**
- TLV'S- THRESHOLD LIMIT VALUES/ **ACGIH**

HAZARDOUS INGREDIENTS

- STEL- SHORT TERM EXPOSURE LIMIT/ NOT TO EXCEED 15 MIN. IN A WORKING DAY.
- CEILING- AN EXPOSURE LEVEL THAT CANNOT BE EXCEEDED.

TIME WEIGHTED AVERAGE. (TWA)

$$\frac{\text{PPM x TIME EXPOSED}}{\text{8 HOURS}} = \text{TWA}$$

PHYSICAL/ CHEMICAL CHARACTERISTICS

- APPEARANCE AND ODOR.
- BOILING POINT.
- VAPOR PRESSURE AND DENSITY.
- SPECIFIC GRAVITY.
- SOLUBILITY.
- MELTING POINT.
- EVAPORATION RATE.

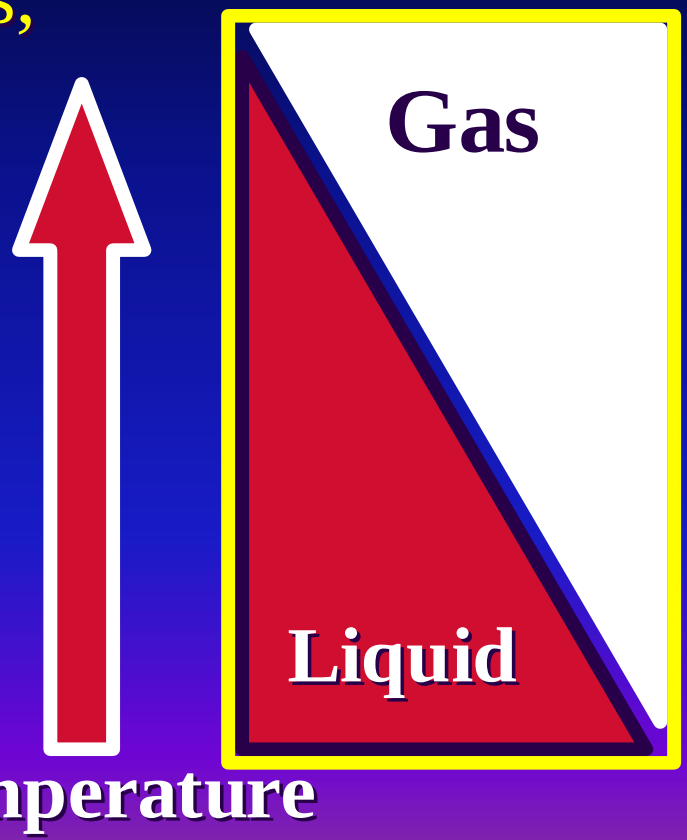
Boiling Point

Temperature at which liquid turns to gas.

As the temperature increases, the chemical releases more and more vapors...

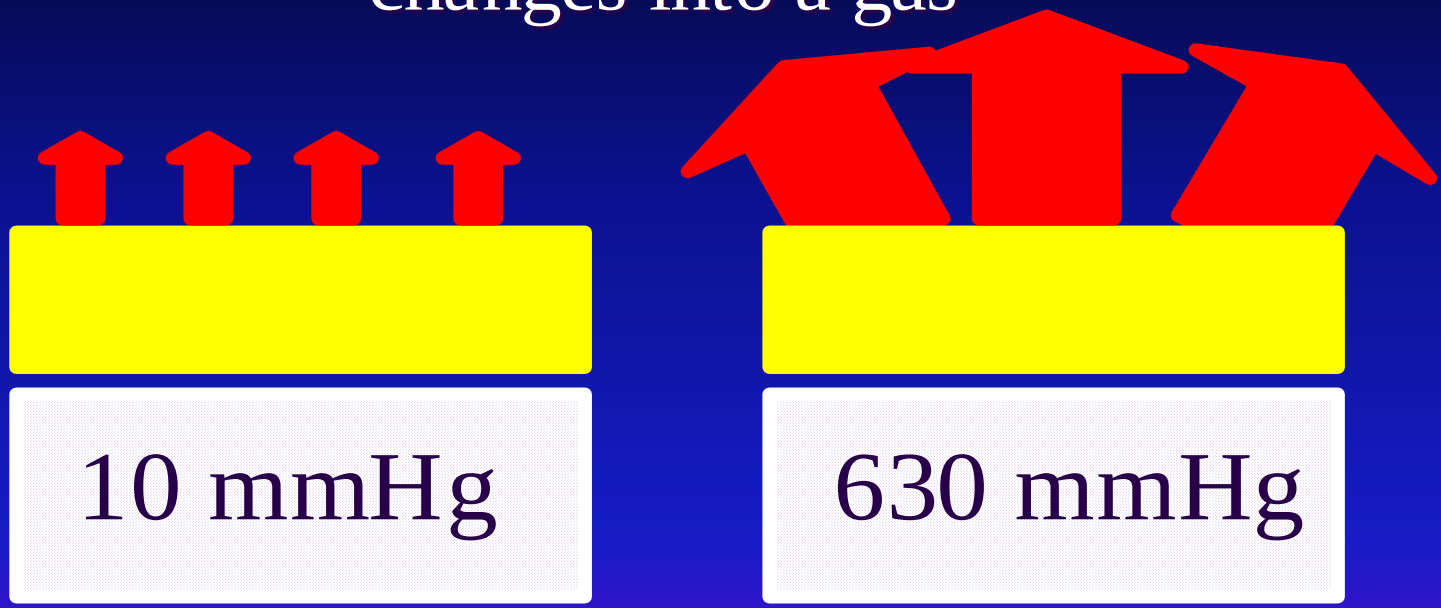
At the boiling point, the chemical turns from liquid to gas.

The lower the boiling point,the more vapors a chemical releases at room temperature.



Vapor Pressure

The force exerted by a chemical as it changes into a gas



The more pressure a chemical exerts against air, the more vapor goes into the air.

Vapor Density

Weight of a vapor in relation to air.

Air = 1.0

Heavier than air	Same as air	Lighter than air
VD = 1.2	VD = 1	VD = 0.5
Hydrogen sulfide	Carbon Monoxide	Methane

The larger the number, the heavier the vapor

Specific Gravity

Weight of chemical compared to water.

Water = 1.0

Lighter than water.

SG<1

The Chemical will float on water

Heavier than water.

SG>1

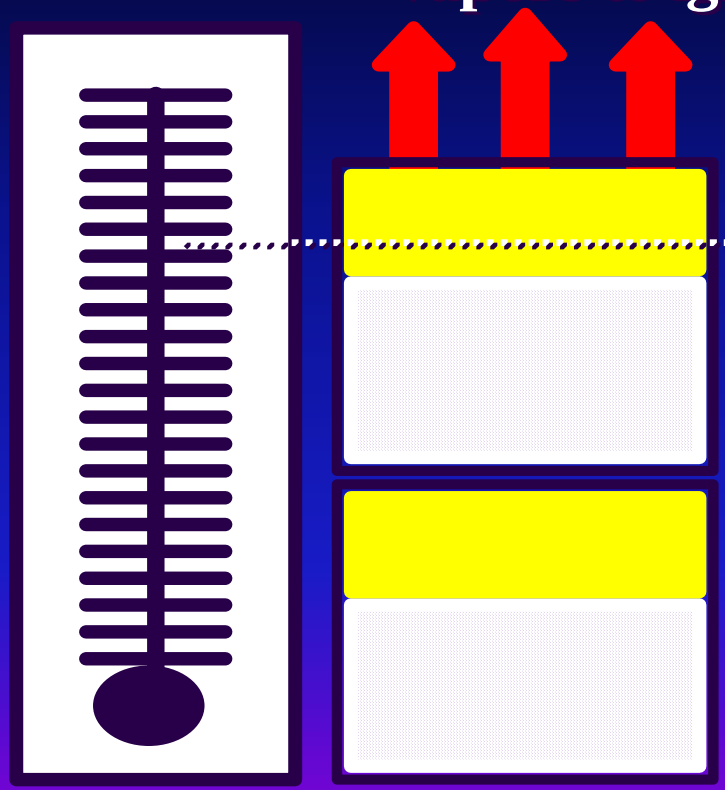
The Chemical will sink in water

FIRE AND EXPLOSION

- FLASH POINT.
- LOWER AND UPPER EXPLOSIVE LIMITS
- EXTINGUISING MEDIA.
- SPECIAL FIRE FIGHTING PROCEDURES.
- UNUSUAL FIRE HAZARDS

Flash Point

Temperature at which a substance releases enough vapors to ignite



Ignitable vapors

200

165^0 F Fuel Oil *

100

Not enough vapors to ignite

*FP may vary from 100^0 to 165^0 F

Hazard Communication

31 of 50

Understanding LEL & UEL

10% 100,000

TOO RICH

Fuel

Heat

UEL 6.0% (60,000 ppm)

5% 50,000

FIRE!

Fuel

Oxygen (O_2)

Heat

LEL 1.3% (13,000 ppm)

1% 10,000

TOO LEAN

Oxygen (O_2)

Heat

Hazard Communication

34 of 50

REACTIVITY

- STABILITY.
- CONDITIONS TO AVOID (STABILITY)
- INCOMPATIBILITY.
- HAZARDOUS DECOMPOSITION PRODUCTS.
- HAZARDOUS POLYMERIZATION.
- CONDITIONS TO AVOID. (POLYMERIZATION)

HEALTH HAZARDS

- THIS SECTION SHOULD BE REVIEWED INITIALLY TO DETERMINE POTENTIAL CARCINOGEN AND OTHER SERIOUS HEALTH EFFECTS

HEALTH HAZARDS

- ROUTES OF ENTRY
- TARGET ORGANS
- CARCINOGENIC

HEALTH HAZARDS

- SIGNS AND SYMPTOMS OF OVER EXPOSURE.
- MEDICAL CONDITION AGGRAVATED BY EXPOSURE.
- EMERGENCY FIRST AID.

HEALTH HAZARDS

- ACUTE- IMMEDIATE AFFECT.
- CHRONIC-LONG TERM EFFECT.
  - USUALLY PERMANENTION/NON-REVERSIBLE

PRECAUTIONS/ SAFE HANDLING

- PROCEDURES FOR MATERIAL SPILL/ RELEASE.
- NEUTRALIZING AGENT.
- WASTE DISPOSAL.
- SAFE HANDLING/ STORAGE.

CONTROL MEASURES

- SUBSTITUTION
- ENGINEERING CONTROLS
- ADMINISTRATIVE PROCEDURES.
- PPE

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