

PHYSICAL AND CHEMICAL CHANGES NOTES



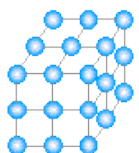
I. A. **Physical properties:** can be observed or measured _____ chemically changing a substance.

B. **Chemical properties:** determines whether or not a substance will _____ chemically.

II. _____: a state in which matter can exist. There are 4 basic types

1. _____ 2. _____ 3. _____ 4. _____ (5. Bose-Einstein condensates)

A. **Solids:** matter with a definite _____ and a definite _____.



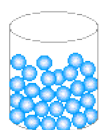
1. _____ **solids:** solid made of molecules arranged in a regular repeating pattern.

Ex: _____

2. _____ **solid:** solid made of molecules _____ arranged in a repeating pattern; particles slowly flow around each other.

Ex: _____

B. **Liquids:** matter with _____ definite shape but with a definite _____.



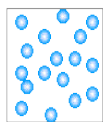
1. **Viscosity:** the _____ of a liquid to _____.

Ex: _____ → low viscosity

_____ → high viscosity



C. **Gases:** matter with _____ definite shape and _____ definite volume.



1. The *behavior* of gases depends on:

- arrangement of particles
- movement of particles

2. **Gas Laws**

a. **Boyle's Law:** the volume of a fixed amount of gas varies _____ with the pressure exerted on it.

BOYLE'S LAW

Pressure	Volume
(_____ collisions)	(_____ space)
(_____ collisions)	(_____ space)

Ex: _____.



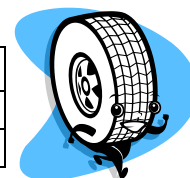
b. **Charles's Law:** the volume of a fixed amount of gas varies _____ with the temperature of the gas.



CHARLES'S LAW

Temperature	Volume

Ex: _____.



D. **Plasma:** matter that has extremely _____ energy and _____ be contained by ordinary means.



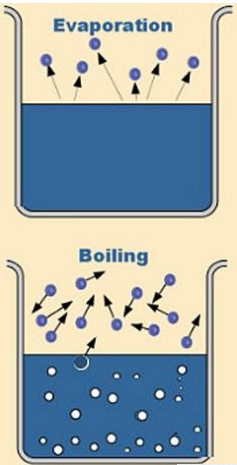


Plasma is _____ on Earth. Ex: _____, stars, & lightning; most abundant phase in universe.
Man-made plasma = neon signs & fluorescent bulbs.



III. Matter changes phases when energy is: a. added / absorbed = _____

OR

b. taken away / released = _____

Phase Change Term	Change in State	NOTES
_____	Solid → Liquid 	❖ Energy is _____ (_____thermic) Ex: _____
_____	 Liquid → Solid	❖ Energy is _____ (_____thermic) Ex: frozen pond
a. Evaporation b. Boiling	Liquid → Gas 	❖ Energy is _____ (_____thermic) a. _____ Ex: _____ b. _____ Ex: bubbling water on stove
_____	Gas → Liquid 	❖ Energy is _____ (_____thermic) Ex: fogged mirror during a hot shower
SUBLIMATION	Solid → Gas	❖ Energy is _____ (_____thermic) Ex: 
DEPOSITION	Gas → Solid	❖ Energy is released (_____thermic) Ex: water particles in air directly freezing on a car window shield