

## TOPIC II QUIZ STUDY GUIDE

### Part I: Physical & Chemical Changes

#### **Physical Change/Properties**

Change when properties of the material change, but composition does not.

- Color
- Shape
- Density
- Malleability
- Dissolving
- Melting point
- Boiling point
- Freezing Point
- (Change of state)

*Reversible:*

Change of state (dissolving)

*Irreversible:*

- malleability
- breaking
- cracking
- spitting
- tearing,
- cutting

Extensive:

Depends upon the **amount** of matter in a sample.

ex.) mass, volume, length, width

Intensive:

Depends on **composition** of matter in a sample

ex.) density, boiling point, freezing point, melting point, luster (shiny), malleable (shape it), hardness, conductivity, color, texture, ductility (pull into wire)

(odor) (taste)--> could be both

#### **Chemical Change/ Properties**

Change that alters the chemical composition of a substance, a new substance is formed.

- burning (combusting)
- reacting
- fizzing/bubbling
- formation of precipitate
- rusting

Part II: Pure Substance or mixture  
(homogeneous/heterogeneous)

**Mixtures & Pure Substances**

Matter

I  
I  
I

-----*Can Substances be separated physically?*-----

NO

I Pure Substances I

I  
I

Elements

substance that can't be broken down into other substances even by chemical processes (1 type of atom)

Compounds

Substance made up of 2 or more elements that can be broken down chemically  
ex) H<sub>2</sub>O, CO<sub>2</sub>, NaCl

Homogeneous

uniform through out uniform composition  
1 phase (one part)  
*"solution"*  
ex.) salt water, sugar water, brass (alloy)

YES

I Mixtures I

I  
I

Heterogeneous

not uniform not uniform comp.  
2 or more phases  
ex) sand + H<sub>2</sub>O  
oil + H<sub>2</sub>O  
salad dressing  
chex mix  
blood

## Part III: Separation of Mixtures-best technique

### **Technique 1:** Simple distillation

- separates a mixture by boiling points. Could be used for soluble solid (homogeneous mixture), but able to recover both solid and liquid.

### **Technique 2:** Filtration

- When you separate insoluble solid from a liquid. Able to recover both solid and liquid.

### **Technique 3:** Chromatography

- homogeneous mixture-1 phase. Separate by attraction to 2 phases in chromatography. Set up stationary-paper & mobile-water. The liquid that travels the furthest(mobile. The liquid that travel's shortest (stationary)

### **Technique 4 :** Evaporation

- Separation of mixture by boiling point. Soluble solid in liquid (ex. salt)-don't care about liquid. Evaporate liquid-left with solid. Not going to recover liquid.

### **Technique 5:** Fractional distillation

- boiling point used to separate homogeneous mixture, two liquids that are "miscible" ("mix")

### **Technique 6:** Centrifuge

- Uses centripetal force, separate insoluble solid from liquid. The particles are too fine to go through filtration (ex. blood)

### **Technique 7:** Decanting "pour off"

- Used for separating 2 immiscible liquids (ex. oil & n water)

### **Technique 8:** Separatory Funnel

- two immiscible liquids-pour off one layer--> better than decanting

Method	# Phases	Type of Matter	Example
1. Chromatography	1	miscible (soluble liquids)	ink
2. Simple distillation	1	homogeneous (soluble solid in all liquid) recover <u>both</u> solid and liquid)	salt + H <sub>2</sub> O
3. Fractional distillation	1	homogeneous 2 miscible liquids	alcohol + H <sub>2</sub> O
4. Evaporation	1	homogeneous soluble solid in a liquid liquid is not recovered	salt + H <sub>2</sub> O
5. Decant	2	heterogeneous 2 miscible liquids	oil + H <sub>2</sub> O
6. Separatory Funnel	2	"	"
7. Filtration	2	heterogeneous insoluble solid in a liquid	Sand + H <sub>2</sub> O
8. Centrifuge	2	" particles are too small & would pass through filter	Lead (II) Iodide (PbI <sub>2</sub> ) muddy H <sub>2</sub> O Blood