

Properties of Matter

***Physical Property=** _____

Ex: _____

***Chemical Property=** _____

Ex: _____

***Intensive Property=** _____

Ex: _____

***Extensive Property=** _____

Ex: _____

Practice: Identify the following properties as either chemical or physical. In addition, identify it as intensive or extensive.

Trait/characteristic	Chemical (C) or Physical (P)	Intensive (I) or Extensive (E)
Boiling point		
Density		
Color		
Flammability		
Solubility in water		
Texture		
reacts with water to form a gas		
Malleability		
Melting point		
Combustibility		
Volume		
reacts with acid		
Blue appearance		

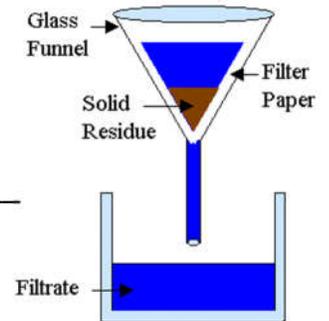
Separation Techniques

Recall, a **mixture** is a combination of _____ that you can _____ into their individual parts _____ what they are. Mixtures can be separated based on their _____ **properties**

1. Filtration

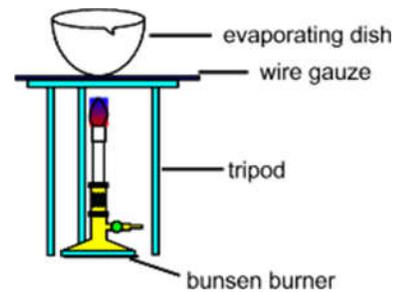
- separation based on different _____ or _____

allows you to separate a _____ by catching the _____ on the _____



2. Evaporation

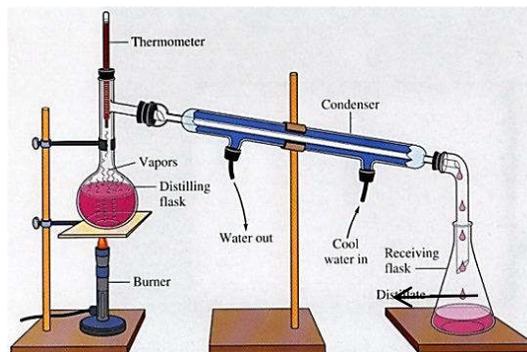
- takes advantage of differences in _____
- can be used to separate _____ mixtures
- Downside: liquid components of mixture are lost to air through evaporation



3. Distillation

- takes advantage of differences in _____
- can be used to separate _____ mixtures
- Superior method to evaporation because all components can be isolated and retained.

Mixture of 2 liquids is placed in a flask over a heat source. The liquid with the _____ boiling point stays in this flask



The liquid with the _____ boiling point collects in this flask

4. Centrifuge

- Separates a mixture based on differences in _____
- Amount of separation depends on speed of centrifuge
- Must be followed by filtration or decanting
- Separates _____ only!

Figure 4: Isopycnic separation with a self-generating gradient

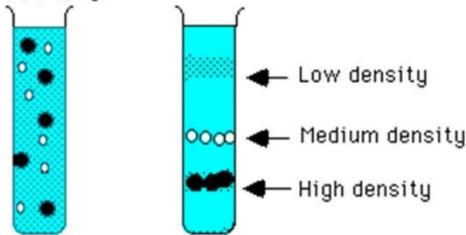
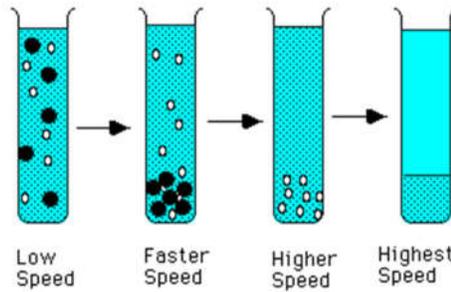
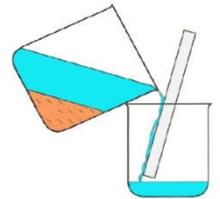


Figure 2: Differential Centrifugation.



5. Decanting

- Takes advantage of differences in _____ and/or _____
- A crude separation technique for _____ mixtures.



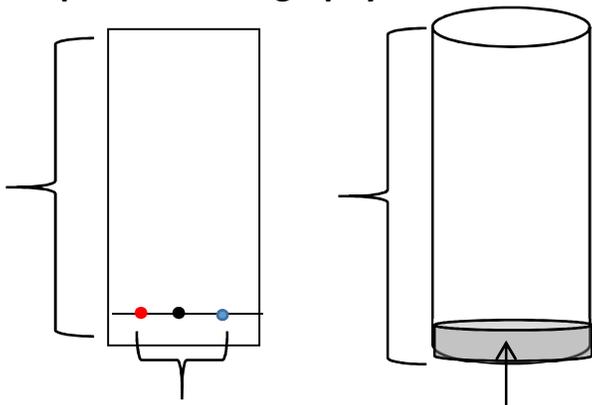
6. Chromatography=a technique that allows you to separate a

_____ based on _____ and/or _____

*polarity=_____

Types of Chromatography:

i. Paper Chromatography

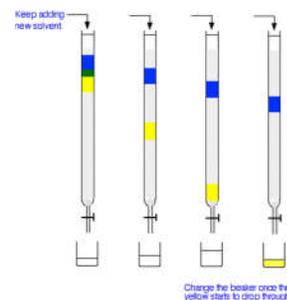


- How the components separate depend on how attracted the individual components are to the _____ versus the _____
- If the components are more attracted to the solvent, _____

- "Like dissolves like"

ii. Column Chromatography

- Separates the components of a mixture based on the differences in _____
 - The _____ molecules exit the column first
 - The _____ molecules exit the column last
- Separation can also be based on polarity (attraction) to the material in the column



7. Others include **sifting, magnetism, etc.**

Separation Techniques Practice

Mixture	Type of Mixture	Differing Physical Properties	Possible Separation Techniques
Ex: Sugar dissolved in water	Homogeneous	*boiling point	*evaporation *distillation
Coffee grounds and water			
Crude Oil (mixture of different hydrocarbons)	Homogeneous	*boiling point	
Water + Barium Sulfate (Barium Sulfate is insoluble in water)			
Mixture of pigments found in a plant leaf: (chlorophyll a/b, xanthophylls, carotene)	Homogeneous	*size *polarity	
Milk (skim milk-- plasma phase—and cream)		*density	
Oil and water			

Separation Challenge: Preparation Sheet

Chemistry

Name _____

- The following table contains some physical properties regarding iron, salt, and sand.

Material	State	Magnetic	Water Soluble
Iron	Solid	Yes	No
Salt	Solid	No	Yes
Sand	Solid	No	No

- Write a procedure for how you would separate a mixture of sand, salt, and iron into 3 separate containers.
- **Indicate what materials you need!**
- You will carry out this procedure next class period