



Medical chemistry- year1



Matter

Lecture 3(part3)

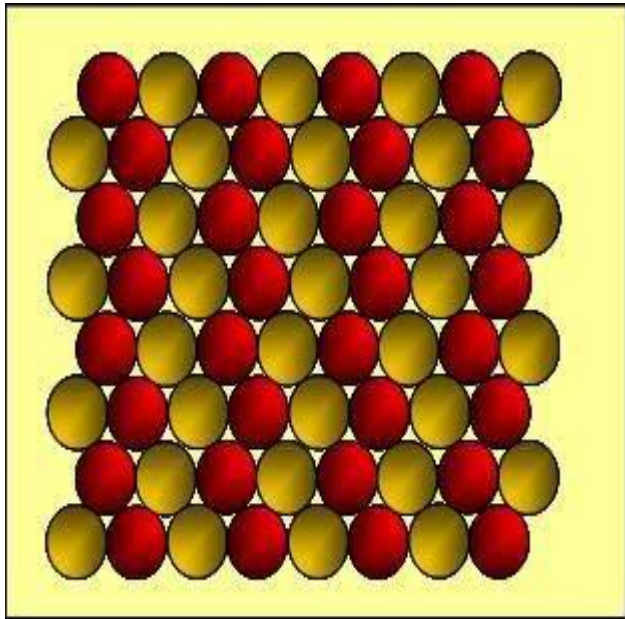
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Objectives

- 1-Definition of matter
- 2-Properties of matter
- 3-State of matter
- 4-Changes in matter
- 5-Classification of matter
- 6-Separation of mixtures

Classification of matter

- all matter composed of atoms
- all matter can be classified or identified as either pure substances or mixtures
- pure substance- kind of matter that cannot be separated by any physical process
- pure substances are considered as either elements or compounds

Classification of matter

1-elements

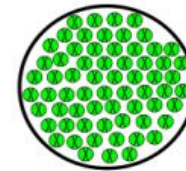
2- Compounds

3- Mixtures

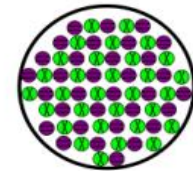
a- Heterogeneous

b- Homogenous(solutions)

Pure Substances

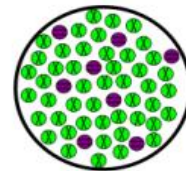


Element

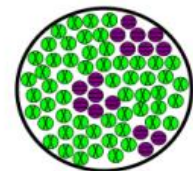


Compound

Mixtures



Homogeneous



Heterogeneous

Elements

- Elements- a substance that cannot be broken down into simpler substance by physical and chemical reaction
- consists only of one kind of atom
- building blocks for other substances
- Elements are organised on the periodic table, based on their properties.
- consists of name and symbol (one, two or three letters).
- 92 naturally occurring elements , 25 synthesised

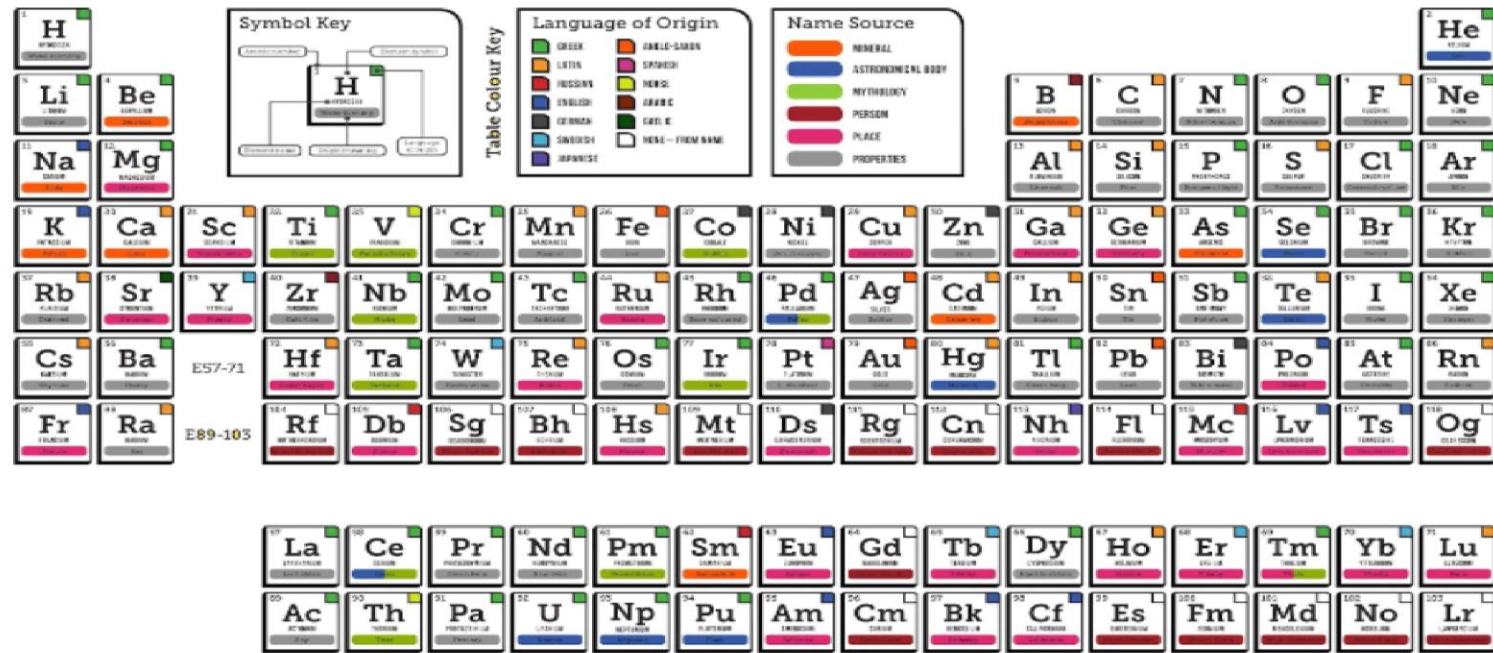
Example:

Cu , Fe , Ag , Si etc .



Lecture 3

PERIODIC TABLE: ELEMENT NAME ORIGINS



Compounds

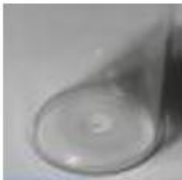
- **Compound** : a substance that consists of two or more elements chemically bonded.
- compound is always composed of the same elements, in the same proportion by mass.
 - Represented by a formula e.g NaCl , H₂O
- most of matter in the universe exists as compounds
- synthesis – combination of elements to form compounds
- decomposition – splitting of compounds into their individual elements .

Compounds

- properties of a compound are different. From its component elements.
- ex: water – liquid at room temp.



Hydrogen—a colorless, tasteless gas



Oxygen—a colorless, tasteless gas



Sodium chloride

- as a compound , it is a white , unreactive solid that adds flavour to food .
- its component elements:

Chlorine—poisonous, pale, green gas

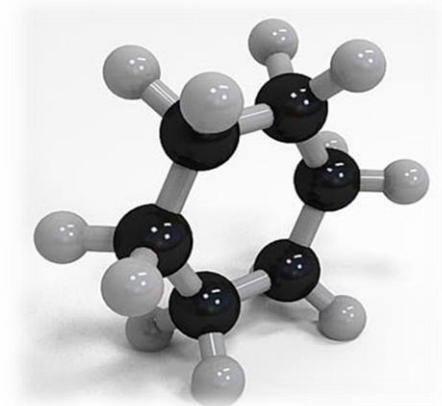


Sodium—a highly reactive metal



Mixtures

- mixtures-combination of two or more substances in which each substance retains its individual properties
- therefore, substances are not chemically combined just mixed physically
- mixtures can be separated by physical methods
- mixtures can either be classified as
 - 1- Homogeneous(solutions)
 - 2-Heterogeneousbased on the distribution of the components



Mixtures

1- homogeneous: mixture where the composition of the substances is constant through .i.e. uniform

- therefore, individual substances are indistinguishable

Ex: mixed molecular by molecule .ex (air , sugar in water).

2-heterogeneous :the mixture is not uniform composition.

- may form suspensions, lumps due to insolubility.
- mixture can easily be separated by physical method e.g filtration.

.Ex: soil .

SEPARATION OF MIXTURES

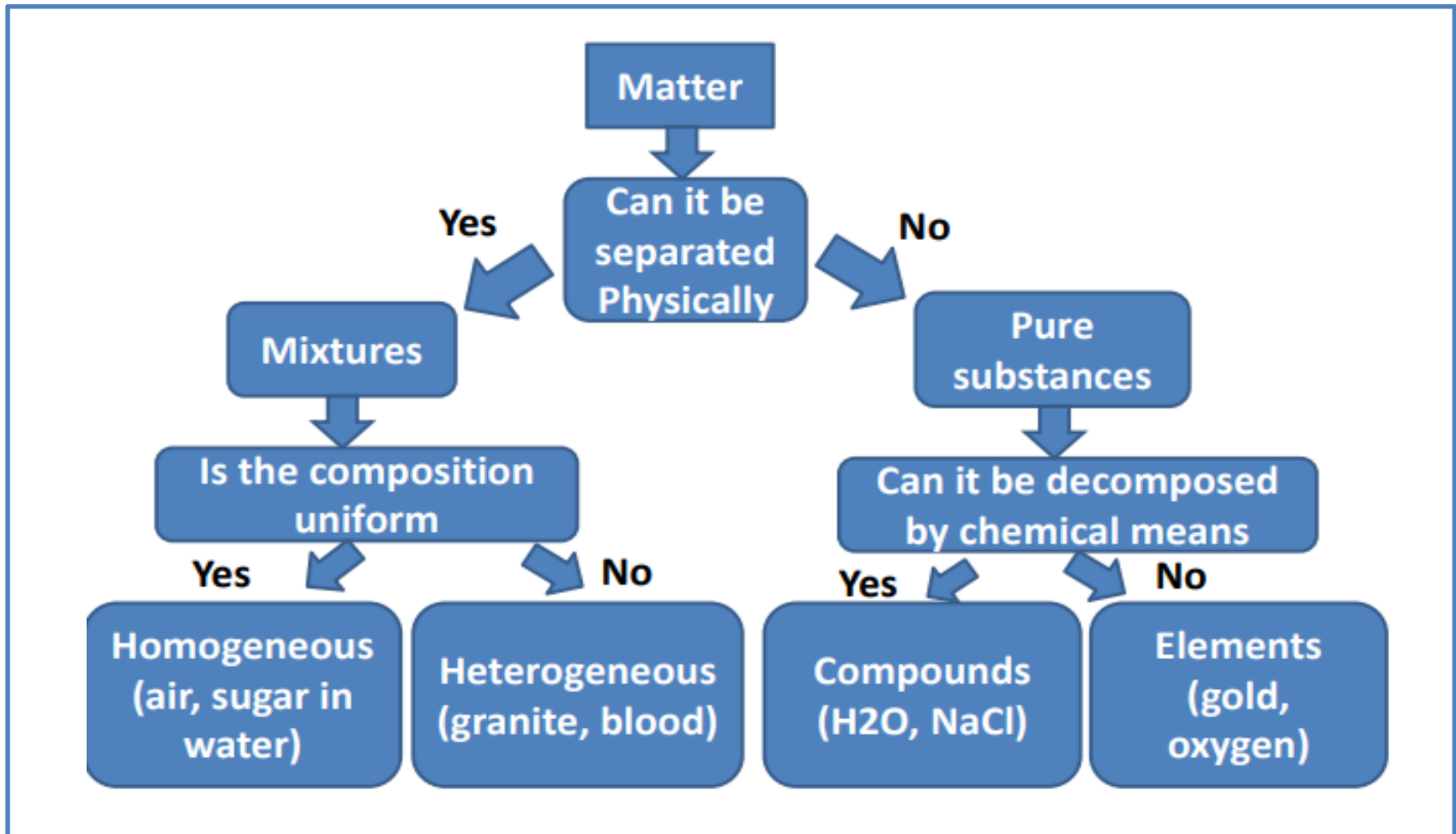
- The different substances within a mixture can be bonded

- Different techniques can be used, depending on the nature of the mixture

Techniques include:

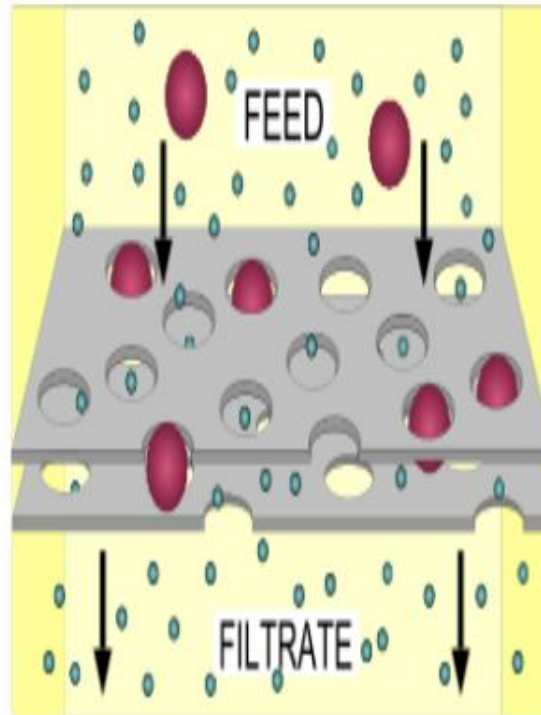
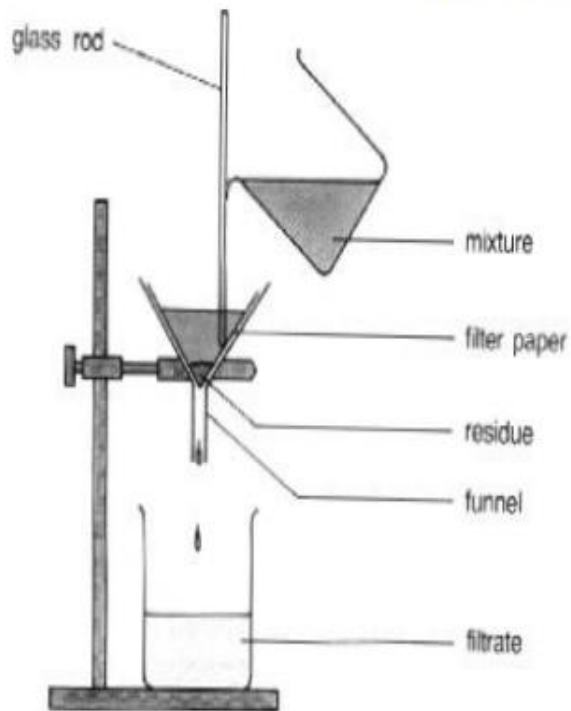
- filtration, centrifugation, evaporation, simple distillation, fractional distillation, separating funnel, chromatography

on the phase the two components exist.



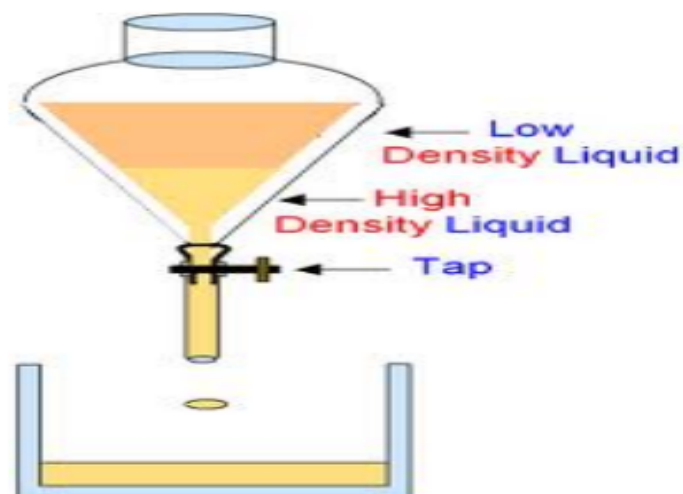
SEPARATION OF MIXTURES

FILTRATION



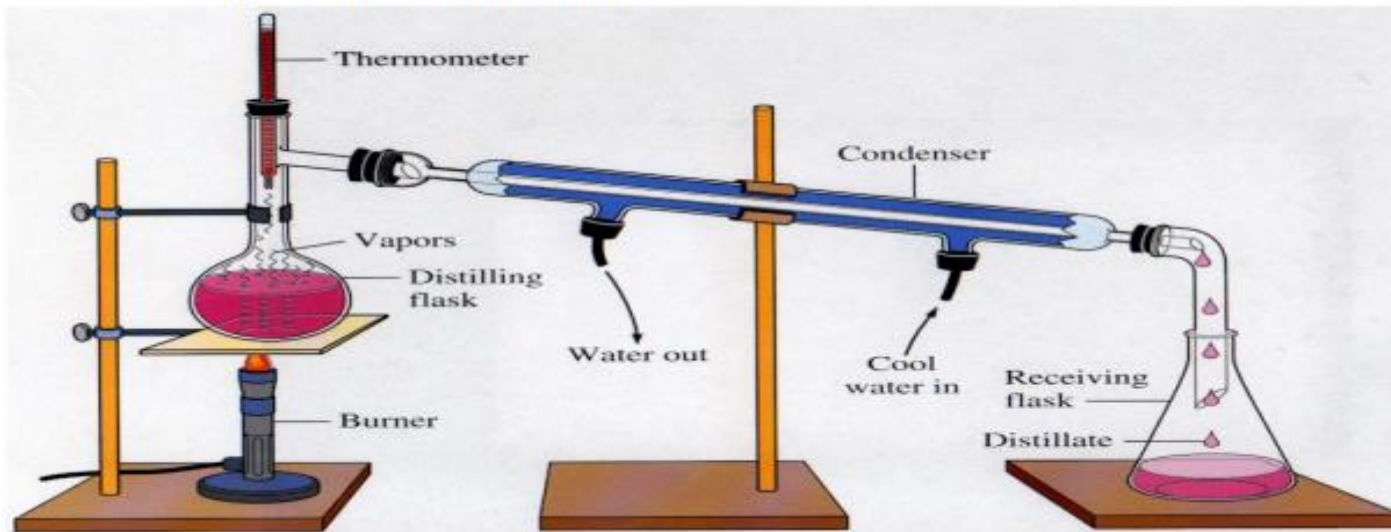
SEPARATION OF MIXTURES

- SEPARATING FUNNEL – use to separate two immiscible liquids
 - Depends on the density
 - E.g. Oil and water



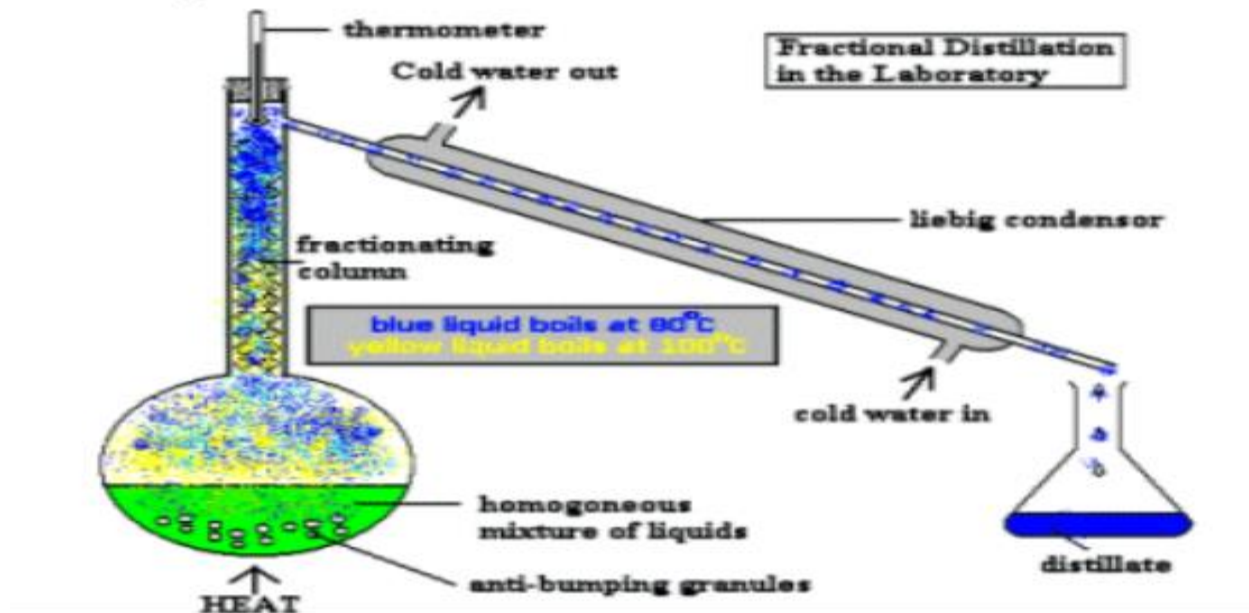
SEPARATION OF MIXTURES

- SIMPLE DISTILLATION – used to separate a pure solvent from a solution
 - Involves vaporization, condensation and collection
 - E.g. Water from salt



SEPARATION OF MIXTURES

- FRACTIONAL DISTILLATION – used to separate one liquid from a mixture of liquids, that have different boiling points
 - E.g. Ethanol and water



Thank You