Solvent extraction

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Experiment study:

Purpose: To separate organic materials whether solid or liquid

Extraction:

It is one of the methods used to separate organic materials solid or liquid,depending on their solubility in different solvents.Two immiscible solvents that differ from each other in density are used,meaning they do not mix using a separating funnel. One of the Solvents is often water and the other is an organic Solvents suchas ether ,Chloroform ,or Carbon tetrachloride.

ImportantNotes to Follow During the Experiment:

1.The extraction process should be rebated several times. The Number of repetitions depends on the propeties of the substance being extrated.For example,if the extraction is repeated 4-6 times Multiple extractions are more efficient than a single extraction

2. The size of the separating funnel depends on the volume of the liquid to be extracted.Typically,the funnel size should be 2-4 times the volume of the liquid.

3.Every extraction using an organic solventmust be followed by a drying process by adding a drying agent. The amount of drying agent ys sufficient when it moves freely in side the flask upon rotation. Example of drying agents in clude:

a. Calcium sulfate
b. Sodium sulfate
c. Calcium chloride
d. Magnessium sulfate
e. Potassium carbnate

4.Continuous venting during shaking is necessary dute to:

A.Shaking generates heat from the evaporation of the organic solvent, which in creases pressure inside the funnel. Therefore, the stopcock of the separating funnel must be opened to release vapor.Otherwise, pressure buildup may lift the stopper and cause the contents to spill.

B.Shaking incresses the surface porosity by allowing the solvents to interact with each other, thus facilitating the extraction process.

c. Determine the upper layer from the lower layer, either by knowing the density or by adding a quantity of water. The increased layer is the water layer, and the other is the organic material.

Procedure:

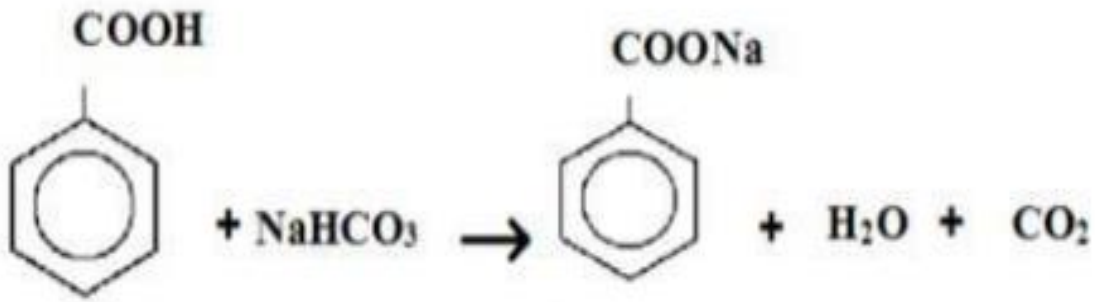
1. The organic solid material dissolves in ether, while san remains undissolved.
2. The mixture is filtered to remove sand. Then water is added as the second solvent.Notransfer occurs between the two substances because the compound is more soluble in ether. Therefore,a simple chemical reaction must be carried out to change the properties of one of the substances, converting it from in solube in water in this case,benzoic acid which is more soluble in ether is converted into a water-soluble substance by adding sodium biccarbonate, leading to a reactionDuring mixing, sodium benzoate froms and transfers the ether

Layer to the aqueous layer .The funnel is shaken and vented repeatedly to release gases formed. Then the funnel is placed upright and allowed to stand until the two layers separate clearly.The aqueous sodium benzoate, is drained.

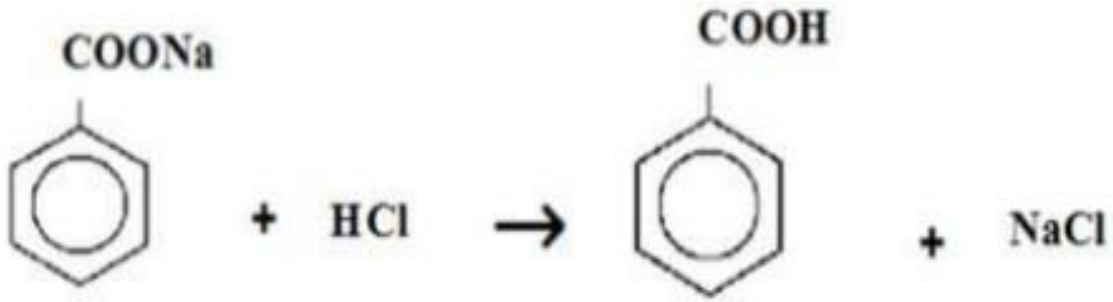
3.The ether layer,which contains b- naphthol,is transferred to another flask and dyring agent is added. After ashort time,it is filtered. The ether is then evaporated using indirected heating water bath becuse ether has alow boiling point.After cooling,b-n aphthol precipitates and is collected by filtation.

Reaction:

Benzoic acid rects with sodium bicarbonate to from sodium benzoate,as shown in the following equation



معادلة لاسترجاع حامض البنزويك:





الطريقة الصحيحة في مسك قمع الفصل عند الرج



قمع الفصل