

## Practical Work n°4: Drying of The Organic Phase and Filtration

### 1. OBJECTIVES

- Understand the principle of drying an organic phase.
- Remove traces of water from an organic solvent.
- Handle an anhydrous drying agent correctly.
- Perform a simple filtration to recover a dry organic solution.
- Interpret the criteria for complete drying.

### 2. THEORETICAL PRINCIPLE

After a liquid-liquid extraction (water/organic solvent), the organic phase always contains a small amount of dissolved water.

To eliminate this residual water, an anhydrous drying agent is added that is capable of binding water molecules to form a hydrated salt.

**General reaction:**                      **Anhydrous salt + nH<sub>2</sub>O → Hydrated salt**

**Example:**                                      **MgSO<sub>4</sub> + 7H<sub>2</sub>O → MgSO<sub>4</sub> · 7H<sub>2</sub>O**

Commonly used desiccants:

- Anhydrous magnesium sulfate ( MgSO<sub>4</sub> )
- Anhydrous sodium sulfate ( Na<sub>2</sub>SO<sub>4</sub> )
- Anhydrous calcium chloride ( CaCl<sub>2</sub> )
- Barium potassium ( KBr )

After the water has settled, the solid is removed by filtration.

### 3. MATERIALS AND REAGENTS

Materials	Reagents
<ul style="list-style-type: none"> <li>- Decanting ampoule</li> <li>- Erlenmeyer</li> <li>- Beaker</li> <li>- Simple funnel</li> <li>- Filter paper</li> <li>- Universal support</li> <li>- Glass stirrer</li> <li>- Balance (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>-Water/organic solvent mixture:</li> <li>- Dichloromethane</li> <li>- Diethyl ether</li> <li>- Chloroform</li> <li>- Anhydrous drying agent ( MgSO<sub>4</sub> , Na<sub>2</sub>SO<sub>4</sub> , KBr or CaCl<sub>2</sub> ) .</li> </ul>

### 5. SAMPLE PREPARATION

1. Introduce the water/organic solvent mixture into the separatory funnel.
2. Shake and let settle.
3. Identify the two phases according to their density.

4. Collect the organic phase in an Erlenmeyer flask.

## 6. EXPERIMENTAL PROTOCOL

### Step 1: Separation

Carefully separate the organic phase.

### Step 2: Drying

Gradually add a small amount of drying agent.

### Step 3: Agitation

Shake gently for 5 to 10 minutes.

### Step 4: Observation

Observe the appearance of the solid:

- If it forms lumps → presence of water.
- If it remains powdery and loose → drying complete.

### Step 5: Filtration

- Assemble a funnel with filter paper.
- Filter the solution into a beaker.
- Recover the dry organic phase.
- Measured the final volume

## 7. RESULTS OBTAINED

-Results table

Solvent	Drying agent	Aspect of the solid	Drying time (min)	Observation
MgSO <sub>4</sub> Na <sub>2</sub> SO <sub>4</sub> K Br CaCl <sub>2</sub>				

## 8. QUESTIONS

1. Why does the organic phase still contain water after decantation?
2. Why is it necessary to add the desiccant gradually?
3. Why is dichloromethane found in the lower phase?
4. What is the difference between MgSO<sub>4</sub> and Na<sub>2</sub>SO<sub>4</sub> in terms of drying speed?
5. Why is it necessary to use perfectly dry equipment?
6. What is the role of filtration in this procedure?