

Edexcel Chemistry IGCSE

Practical 2.43C: Prepare a sample of
pure, dry lead(II) sulfate
(chemistry only)

Notes



Preparing lead(II) sulfate

Aim

To prepare a sample of pure, dry lead(II) sulfate using filtration.

Equipment list

- 250 cm³ conical flask
- 250 cm³ beaker
- Filter paper and funnel
- Drying oven
- Measuring cylinder
- Glass rod
- Evaporating dish
- Digital balance

Chemicals required

- Aqueous lead(II) nitrate
- Aqueous potassium sulfate
- Deionised water

Method

1. Add 75 cm³ of lead nitrate and 75 cm³ potassium sulfate to a beaker. Mix the solutions with a glass rod until a precipitate forms.
2. Put the filter paper in the funnel and place it over the conical flask.
3. Pour the mixture from the beaker into the funnel.
4. Use deionised water to wash any solid left in the beaker into the funnel. Wash the filtrate (the solid in the filter paper) by pouring deionised water over the filter paper. This will remove any traces of potassium nitrate.
5. Once all the liquid has filtered through the funnel, remove the filter paper from the funnel.
6. Measure the mass of an empty evaporating dish.
7. Transfer the filtrate onto an evaporating dish and leave to dry in a drying oven.
8. Once the lead(II) sulfate crystals are dry, weigh the evaporating dish containing the crystals. Calculate the mass of lead(II) sulfate formed.

Key points

- The equation for the reaction that occurs is:
$$\text{Pb}(\text{NO}_3)_2 + \text{K}_2\text{SO}_4 \rightarrow \text{PbSO}_4 + 2\text{KNO}_3$$
- Lead nitrate and potassium sulfate are both soluble. Lead sulfate is insoluble which is why it can be removed by filtration.
- Washing the beaker in step 4 means no lead sulfate is lost when transferring the mixture from the beaker to the funnel.



Diagram

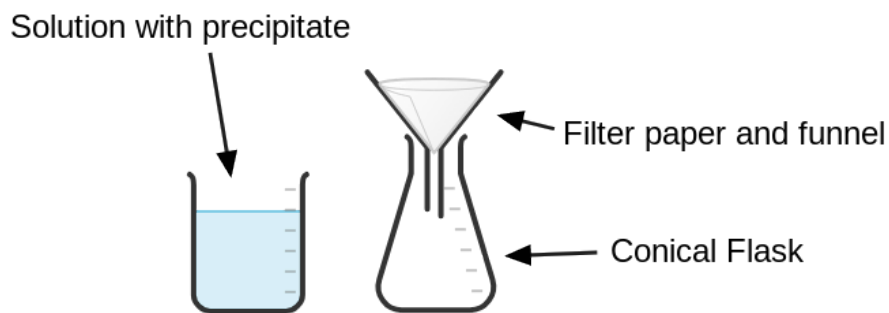


Figure 1 Filtration Process Setup

[Chemix](#)

Safety precautions

- Lead sulfate is toxic by inhalation, ingestion and skin contact. Wash hands immediately if the skin comes into contact with the lead sulfate.
- Lead nitrate is an irritant. Avoid touching it and wash hands immediately if the skin comes into contact with it.
- Be careful when handling glassware. Clear up any broken glass immediately.

Analysis of results

To find the mass of lead sulfate after drying, subtract the mass of the empty evaporating basin (step 6) from the mass of the evaporating dish containing the crystals (step 8).

If you know/ calculate the theoretical yield, it is possible to calculate the percentage yield:

$$\text{Percentage yield} = \frac{\text{Yield}}{\text{Theoretical yield}} \times 100$$

If the percentage yield is less than 100%, not all the product was collected. Either some was lost when transferring the mixture from the beaker or the reaction was incomplete.

If the percentage yield is greater than 100%, the product is not fully dry. This means it contains water which is adding to the mass.

