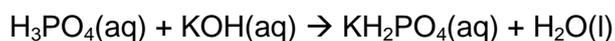


## Preparation of potassium dihydrogenphosphate

### Student worksheet

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Potassium dihydrogen phosphate is a complex fertiliser. It is often shortened to MKP. This simple salt is a source of two nutrients – potassium and phosphorous. It can be made by partially neutralising dilute phosphoric acid with potassium hydroxide solution.



### Equipment and materials

- Evaporating basin
- Tripod and gauze
- Bunsen burner
- 10 cm<sup>3</sup> pipette
- Burette and stand
- 100 cm<sup>3</sup> conical flask
- Filter funnel and filter paper and conical flask (to stand funnel on)
- Glass rod
- 1 mol dm<sup>-3</sup> phosphoric acid
- 1 mol dm<sup>-3</sup> potassium hydroxide solution
- Methyl orange indicator solution
- Dessicator

### Method

**Care:** Wear eye goggles (BS EN166 3 safety specification). 1 mol dm<sup>-3</sup> potassium hydroxide is corrosive. 1 mol dm<sup>-3</sup> phosphoric acid is an irritant to the eyes, lungs and the respiratory system.

1. Use a pipette to transfer 10 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> potassium hydroxide solution to a conical flask.
2. Add a few drops of methyl orange indicator to the conical flask.
3. Add 1 mol dm<sup>-3</sup> phosphoric acid to the flask from a burette until the indicator changes colour. Make a note of the volume of acid added.
4. Use a pipette to transfer 10 cm<sup>3</sup> of 1 mol dm<sup>-3</sup> potassium hydroxide to an evaporating basin.
5. Use a burette to add the volume of 1 mol dm<sup>-3</sup> phosphoric acid noted in step 3 to the evaporating basin.
6. Put the evaporating basin on a tripod and gauze. Slowly evaporate the solution until it is about one-fifth of its original volume. Caution: Do not boil the solution as it may spit.
7. Allow the concentrated solution to cool until crystals form.
8. Filter off the crystals and put the filter paper and crystals on a watch glass and dab dry with another piece of filter paper. Leave them to dry at room temperature in a dessicator (the salt is deliquescent – it absorbs moisture from the atmosphere very easily).
9. Label a sample tube with the name of the product, your name and the date. Weigh the labelled sample tube and record its mass.
10. Tip your dry product into the sample tube. Weigh the tube again. Record its mass.
11. Store the dried product in a suitably labelled sample bottle.

### Calculations

Calculate the theoretical yield and percentage yield of potassium dihydrogenphosphate, KH<sub>2</sub>PO<sub>4</sub>.