# Preparing solutions for microscale chemistry

## Barium (nitrate)

To prepare a 0.2 mol dm–3 barium nitrate solution, dissolve 5.2 g of Ba(NO3)2 in 100 cm3 of deionised water.

Barium nitrate is an oxidizing agent and is harmful if swallowed or inhaled.

A 0.2 mol dm–3 solution is of low hazard.

## Calcium (nitrate)

To prepare a 0.5 mol dm–3 calcium nitrate solution, dissolve 11.8 g of Ca(NO3)2.4H2O in 100 cm3 of deionised water.

To prepare a 0.2 mol dm–3 calcium nitrate solution, dissolve 4.7 g of Ca(NO3)2.4H2O in 100 cm3 of deionised water.

Calcium nitrate is an oxidizing agent, is harmful if swallowed and is a skin/eye irritant.

A 0.5 mol dm–3 solution is a skin/eye irritant and a 0.2 mol dm–3 solution is of low hazard.

## Chromium (potassium chromate)

To prepare a 0.2 mol dm–3 potassium chromate solution, dissolve 3.9 g of K2CrO4 in 100 cm3 of deionised water.

Potassium chromate is a carcinogen, mutagen and skin sensitiser as well as a skin/eye/respiratory irritant.

A 0.2 mol dm–3 solution is a carcinogen, mutagen and skin sensitiser.

## Cobalt (nitrate)

To prepare a 0.5 mol dm−3 cobalt nitrate solution, dissolve 14.6 g of Co(NO3)2.6H2O in 100 cm3 of deionised water.

Both the solid and a 0.5 mol dm–3 solution is a carcinogen, mutagen, reproductive toxin, skin and respiratory sensitiser and toxic to aquatic life.

## Copper (sulfate)

To prepare a 0.5 mol dm−3 copper sulfate solution, dissolve 12.5 g of CuSO4.5H2O in 100cm3 of deionised water.

To prepare a 0.2 mol dm−3 copper sulfate solution, dissolve 5.0 g of CuSO4.5H2O in 100cm3 of deionised water.

Copper sulphate causes serious eye damage, is harmful if swallowed and is toxic to aquatic life.

Both 0.5 and 0.2 mol dm–3 solutions cause serious eye damage and are toxic to aquatic life.

## Iron

### Iron(III) nitrate

To prepare a 0.2 mol dm−3 iron(III) nitrate solution, dissolve 8.1 g of Fe(NO3)3.9H2O in 100 cm3 of deionised water.

Iron(III) nitrate is an oxidiser and a skin/eye/respiratory irritant.

A 0.3 mol dm–3 solution is of low hazard.

### Iron(II) sulfate

To prepare a 0.2 mol dm−3 iron(II) sulfate solution, dissolve 5.6 g of FeSO4.7H2O in 100 cm3 of deionised water. Add sulphuric acid (1 mol dm−3) to make up to 200 cm3. (The presence of the acid minimises the hydrolysis of iron(ll).)

Iron(II) sulphate is harmful if swallowed and a skin/eye irritant.

A 0.2 mol dm–3 solution made as above will be of low hazard.

## Lead (nitrate)

To prepare a 0.5 mol dm−3 lead nitrate solution, dissolve 16.6 g of Pb(NO3)2 in 100 cm3 of deionised water.

Lead nitrate is an oxidiser, harmful if swallowed or inhaled, is corrosive to skin and eyes, is a reproductive toxin and is very toxic to aquatic life.

A 0.5 mol dm–3 solution is corrosive to skin and eyes, a reproductive toxin and very toxic to aquatic life.

## Lithium (bromide)

To prepare a 1 mol dm−3 lithium bromide solution, dissolve 4.3 g of lithium bromide in 50 cm3 of deionised water.

Lithium bromide is harmful if swallowed and a skin/eye irritant.

A 1 mol dm–3 solution is of low hazard.

## Magnesium (nitrate)

To prepare a 0.5 mol dm−3 magnesium nitrate solution, dissolve 7.4 g of Mg(NO3)2 in 100 cm3 of deionised water.

Magnesium nitrate is an oxidiser and a skin/eye/respiratory irritant.

A 0.5 mol dm–3 solution is of low hazard.

## Manganese (potassium manganate)

To prepare a 0.01 mol dm–3 potassium manganate(VII) solution, dissolve 0.16 g of KMnO4 in 100 cm3 of deionised water.

Potassium manganate VII is an oxidiser, is harmful if swallowed and is toxic to aquatic life.

A 0.01 mol dm-3 solution is of low hazard.

## Molybdenum (ammonium molybdate)

To prepare a 0.05 mol dm–3 ammonium molybdate solution, dissolve 6.2 g of (NH4)6Mo7O24.4H2O in 100 cm3 of water.

Ammonium molybdate Is harmful if swallowed and a skin/eye/respiratory irritant.

A 0.05 mol dm-3 solution is of low hazard.

## Nickel (nitrate)

To prepare a 0.5 mol dm–3 nickel nitrate solution, dissolve 14.5 g of Ni(NO3)2.6H2O in 100 cm3 of deionised water.

Nickel nitrate is an oxidiser, Is harmful if swallowed ir inhaled, is a skin irritant, causes serious eye damage, is a skin and respiratory sensitiser, is a carcinogen (by inhalation), a mutagen, a reproductive toxin, causes damage to organs and is very toxic to aquatic life.

A 0.5 mol dm-3 solution is a skin irritant, causes serious eye damage, is a skin and respiratory sensitiser, is a carcinogen (by inhalation), a mutagen, a reproductive toxin, causes damage to organs and is very toxic to aquatic life.

## Potassium

### Potassium bromide

To prepare a 0.2 mol dm–3 potassium bromide solution, dissolve 2.4 g KBr in 100 cm3 of deionised water.

Potassium bromide is an eye irritant.

A 0.2 mol dm–3 solution is of low hazard.

### Potassium iodide

To prepare a 0.2 mol dm–3 potassium iodide solution, dissolve 3.3 g Kl in 100 cm3 of deionised water.

Potassium iodide is an eye irritant.

A 0.2 mol dm–3 solution is of low hazard.

## Silver (nitrate)

To prepare a 0.1 mol dm–3 silver nitrate solution, dissolve 1.7 g of AgNO3 in 100 cm3 of deionised water. Store in a dark place.

Silver nitrate is an oxidiser, is corrosive to skin and eyes and is very toxic to aquatic life.

A 0.1 mol dm–3 solution is a skin/eye irritant.

## Sodium

### Sodium fluoride

To prepare a 0.5 mol dm–3 sodium fluoride solution, dissolve 1.1 g of NaF in 50 cm3 of deionised water.

Sodium fluoride is toxic if swallowed and a skin/eye irritant.

A 0.5 mol dm–3 solution is of low hazard.

### Sodium carbonate

To prepare a 0.5 mol dm–3 sodium carbonate solution, dissolve 5.3 g of Na2CO3 in 100 cm3 of deionised water.

Sodium carbonate is an eye irritant.

A 0.5 mol dm–3 solution is of low hazard.

### Sodium chloride

To prepare a 0.5 mol dm–3 sodium chloride solution, dissolve 2.9 g of NaCl in 100 cm3 of deionised water.

Sodium chloride is of low hazard.

### Sodium sulfate

To prepare a 0.5 mol dm–3 sodium sulfate solution, dissolve 7.1 g of Na2SO4 in 100 cm3 of deionised water.

Sodium sulfate is of low hazard.

## Strontium (nitrate)

To prepare a 0.5 mol dm–3 strontium nitrate solution, dissolve 10.6 g of Sr(NO3)2 in 100 cm3 of deionised water.

Strontium nitrate is an oxidiser and causes serious eye damage.

A 0.5 mol dm–3 solution causes serious eye damage.

## Tungsten (sodium tungstate)

To prepare a 0.2 mol dm–3 sodium tungstate solution, dissolve 6.6 g of Na2WO4.2H2O in 100 cm3 of deionised water.

Sodium tungstate is harmful if swallowed, causes serious eye damage and is toxic to aquatic life.

A 0.2 mol dm–3 solution causes serious eye damage and is toxic to aquatic life.

## Vanadium (ammonium vanadate)

To prepare a 0.2 mol dm–3 ammonium vanadate solution, dissolve 2.3 g NH4VO3 in 100 cm3 of deionised water.

Ammonium vanadate is harmful if swallowed, inhaled or in contact with the skin.

A 0.2 mol dm-3 solution is of low hazard.

## Zinc (sulfate)

To prepare a 0.2 mol dm–3 zinc sulfate solution, dissolve 5.8 g of ZnSO4.7H2O in 100 cm3 of deionised water.

Zinc sulphate is harmful if swallowed, causes serious eye damage and is toxic to aquatic life.

A 0.2 mol dm–3 solution causes serious eye damage and is toxic to aquatic life.