Preparing solutions for microscale chemistry

**Barium (nitrate)**

To prepare a 0.2 mol dm$^{-3}$ barium nitrate solution, dissolve 5.2 g of Ba(NO$_3$)$_2$ in 100 cm$^3$ 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(NO$_3$)$_2$.4H$_2$O in 100 cm$^3$ of deionised water.

To prepare a 0.2 mol dm$^{-3}$ calcium nitrate solution, dissolve 4.7 g of Ca(NO$_3$)$_2$.4H$_2$O in 100 cm$^3$ 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 K$_2$CrO$_4$ in 100 cm$^3$ 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(NO$_3$)$_2$.6H$_2$O in 100 cm$^3$ 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 CuSO$_4$.5H$_2$O in 100 cm$^3$ of deionised water.
To prepare a 0.2 mol dm$^{-3}$ copper sulfate solution, dissolve 5.0 g of CuSO$_4$.5H$_2$O in 100 cm$^3$ 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(NO$_3$)$_3$.9H$_2$O in 100 cm$^3$ 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 FeSO$_4$.7H$_2$O in 100 cm$^3$ of deionised water. Add sulphuric acid (1 mol dm$^{-3}$) to make up to 200 cm$^3$. (The presence of the acid minimises the hydrolysis of iron(II).)

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(NO$_3$)$_2$ in 100 cm$^3$ 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 cm$^3$ 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(NO$_3$)$_2$ in 100 cm$^3$ 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 KMnO$_4$ in 100 cm$^3$ 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 (NH$_4$)$_6$Mo$_7$O$_{24}$.4H$_2$O in 100 cm$^3$ 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(NO$_3$)$_2$.6H$_2$O in 100 cm$^3$ of deionised water.

Nickel nitrate is an oxidiser, is harmful if swallowed or 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

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To prepare a 0.2 mol dm$^{-3}$ potassium bromide solution, dissolve 2.4 g KBr in 100 cm$^3$ 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 KI in 100 cm$^3$ 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 AgNO$_3$ in 100 cm$^3$ 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 fluoride**

To prepare a 0.5 mol dm$^{-3}$ sodium fluoride solution, dissolve 1.1 g of NaF in 50 cm$^3$ 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 Na$_2$CO$_3$ in 100 cm$^3$ 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 cm$^3$ 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 Na$_2$SO$_4$ in 100 cm$^3$ 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(NO$_3$)$_2$ in 100 cm$^3$ 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 Na$_2$WO$_4$.2H$_2$O in 100 cm$^3$ 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 NH$_4$VO$_3$ in 100 cm$^3$ 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 ZnSO$_4$.7H$_2$O in 100 cm$^3$ 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.