

# Chemistry Applications Disk 1 – Apparatus list

## Conductivity - water & solutions

ALBA, serial lead and plug top supply, conductivity sensor, 0.05 M hydrochloric acid, ethanoic acid, and sodium hydroxide, solid sodium chloride, distilled water, 0.01g balance, 4 x 100ml & 250ml beaker, 1000 $\mu$ S NaCl solution (provided with sensor) OR 10,000  $\mu$ S (5.566 g of Analar NaCl per litre of de-ionised water), 0 $\mu$ S (in air)

## Conductivity & pH - acids/bases

ALBA, serial lead and plug top power supply, pH electrode and connecting box, conductivity sensors, distilled water, 0.05M solutions of hydrochloric acid, ethanoic acid, sodium hydroxide and ammonia, 4 x 100ml & 1 x 250ml beaker. Optional: buffer solutions pH 4 & 10, 1000 $\mu$ S NaCl solution (provided with sensor) OR 10,000 $\mu$ S NaCl solution (5.566 g of Analar NaCl per litre of de-ionised water), 0 $\mu$ S (in air)

## Light - Persulphate/iodide Rate

ALBA, serial lead and plug top supply, light sensor, 12V MES lamp, 12V DC power supply, 0.1 M solution of sodium persulphate (23.8 g l<sup>-1</sup>), potassium iodide/sodium thiosulphate (50g of KI + 6 cm<sup>3</sup> of 1 M thiosulphate in one litre of solution), fresh starch solution, 10ml syringe, 2 x 50ml measuring cylinders, 100ml beaker

## Light - Thiosulphate/Acid Rate

ALBA, serial lead and plug top supply, light sensor, 12V 2.4W MES lamp, 12V DC power supply, 60 g l<sup>-1</sup> sodium thiosulphate, 0.1 M hydrochloric acid, 50ml measuring cylinder, 10ml syringe, 2x100ml beakers

## pH - Buffers

ALBA, serial lead and plug top supply, pH electrode and connecting box, magnetic stirrer and flea, 50 ml burette, pH 7 buffer solution, distilled water, 0.01 M sodium hydroxide and hydrochloric acid

## pH - Common Solutions

ALBA, serial lead and plug top supply, pH electrode, connecting box, pH 7 buffer solution, distilled water, universal indicator, solutions of common laboratory and house chemicals, 8 boiling tubes in rack, 250ml beaker. Optional: buffer solutions pH 4 and 10.

## pH - Neutralization

ALBA, serial lead and plug top supply, pH electrode, connecting box, magnetic stirrer and flea, 0.1M solutions of HCl, NaOH, CH<sub>3</sub>COOH and NH<sub>3</sub>(aq), universal indicator, 25ml pipette, 2x50ml burettes, 100ml beaker. Optional: buffer solutions pH 4 and 10.

## Temperature - Enthalpy of Solution

ALBA, serial lead and plug top supply, temperature sensor, magnetic stirrer and flea (optional), sodium hydroxide pellets, 0.01g balance, polystyrene cup with hole in lid to take temperature probe, 100ml measuring cylinder, clamp stand.

## Temperature - Exo/endothemic Reactions

ALBA, serial lead and plug top supply, temperature sensor, 8 pieces of magnesium ribbon 2/3cm, citric acid, sodium hydrogencarbonate, 1 M hydrochloric acid, polystyrene cup with hole in lid to take temperature probe, 0.1g balance, 100 ml measuring cylinder, clamp stand, large plastic beaker

## Timing - Area/Rate

250ml conical flask fitted with delivery tube and 20ml syringe, 1 M hydrochloric acid, three sizes of marble chips approx (8-10mm, 3-5mm and 1-2mm), 0.1g balance, 100ml measuring cylinder, water trough, 100ml beaker.

## Timing - Concentration/Rate

250ml conical flask fitted with delivery tube and 20ml syringe, hydrochloric acid 0.5M, 1M and 2.0 M, marble chips, balance (0.1g), 100ml measuring cylinder, water trough, 100ml beaker, clamp stand.

## Timing - Catalysis/Rate

250ml conical flask fitted with delivery tube and 10ml syringe, "10 Volume" hydrogen peroxide, manganese(IV) oxide, catalase solution (10 drops of standard bovine catalase in 10 ml of water), 2 x 100ml measuring cylinders, clamp stand, water trough, 100ml beaker, dropping pipette.