



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017**

Chemistry

Assessment Unit AS 3

assessing

**Module 3: Basic Practical Chemistry
Practical Booklet B**

[SCH32]

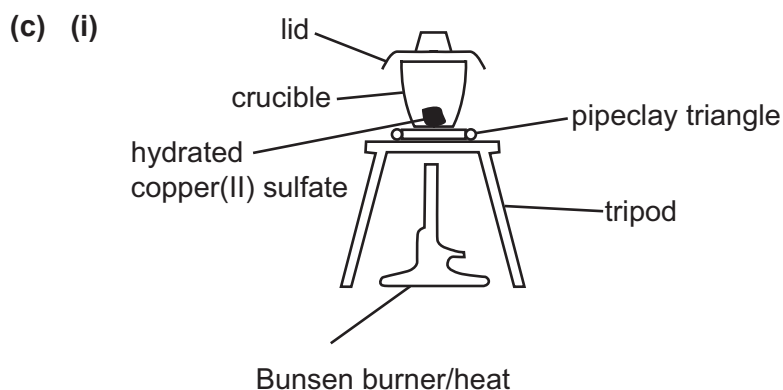
FRIDAY 9 JUNE, AFTERNOON

**MARK
SCHEME**

- 1 (a) (i) Weigh 2.79g of hydrated sodium carbonate in a named suitable container [1]
 Transfer to a beaker and add 50–100 cm³/a suitable amount of deionised water and dissolve/stir until solid dissolves [1]
 Transfer to a 250.0 cm³ volumetric flask with washings [1]
 Add deionised water until the bottom of the meniscus lies upon the mark. Invert to mix [1] [4]

- (ii) Methyl orange [1]
 Yellow to red [2] [3]

- (b) $0.00225/2.25 \times 10^{-3}$ mol
 $0.00225/2.25 \times 10^{-3}$ mol
 $0.0225/2.25 \times 10^{-2}$ mol
 2.385 g
 $2.79 - 2.385 = 0.405$ g
 $0.405/18 = 0.0225$ mol
 $0.0225/0.0225 = 1$ [5]
 [-1] for each mistake



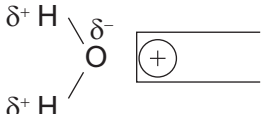
Each mistake [-1] [3]

- (ii) Do not touch hot apparatus/allow to cool [1]

- (iii) Mass of hydrated copper(II) sulfate = 5.0 g
 Mass of water = 1.67 g
 Percentage = $1.67/5 \times 100 = 33.4\%$ [2]

AVAILABLE
 MARKS

18

			AVAILABLE MARKS	
2	(a) (i)	Repeated boiling and condensing of a (reaction) mixture	[1]	11
		(ii) Place the distillate in a conical flask and add the anhydrous sodium sulfate Swirl until the liquid is clear/no longer cloudy Decant/filter off the liquid	[3]	
	(b)	mass of propan-2-ol = $11.5 \times 0.79 = 9.085 \text{ g}$ mol of propan-2-ol = $9.085/60 = 0.1514$ 0.1514 mol of propan-2-ol gives 0.154 mol propanone mol of propanone = $7.0/58 = 0.1207$ % yield = $0.1207/0.1514 \times 100 = 79.72/80\%$	[3]	
		(c) Peak between $3200\text{--}3600 \text{ cm}^{-1}$ due to —OH [1] is absent from spectrum of distillate [1] Peak between $1650\text{--}1800 \text{ cm}^{-1}$ due to C=O [1] is present	[3]	
(d)	Propanoic acid would form	[1]		
3	(a) (i)	The enthalpy change when one mole of a substance is completely burnt in oxygen under standard conditions	[2]	10
		(ii) $\text{C}_3\text{H}_8\text{O} + 4.5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$ or $2\text{C}_3\text{H}_8\text{O} + 9\text{O}_2 \rightarrow 6\text{CO}_2 + 8\text{H}_2\text{O}$	[2]	
	(iii)	Copper is a good conductor of heat/copper has a low (specific) heat capacity/copper does not absorb much heat/reduce heat loss	[1]	
	(iv)	To ensure the heat/energy/heat energy is (evenly) distributed (throughout the water)	[1]	
	(b) (i)	$100 \times 4.2 \times 36 = 15120 \text{ J} = 15.12 \text{ kJ}$ $0.60 \text{ g} = 0.60/60 = 0.01 \text{ mol}$ enthalpy of combustion = $-15.12 \times 100 = -1512 \text{ kJ mol}^{-1}$	[3]	
(ii) Heat loss (to surroundings)		[1]		
4	(a)	Liquid A is polar, liquid B is non-polar. Polar liquid has dipoles which are attracted to the charged rod	[2]	3
	(b)		[1]	

			AVAILABLE MARKS
5	(a) $\text{NH}_4\text{Cl} + \text{NaOH} \rightarrow \text{NH}_3 + \text{NaCl} + \text{H}_2\text{O}$	[1]	7
	(b) U-tube	[1]	
	(c) Removes water	[1]	
	(d) (Some of) the copper(II) sulfate turns (from white to) blue [1]	[1]	
	(e) Ammonia [1] is an alkali [1]	[2]	
	(f) Nitrogen	[1]	
6	Dip nichrome wire into concentrated hydrochloric acid Dip into sample/calcium carbonate and place in the blue Bunsen flame Brick red flame observed/red flame is observed	[3]	6
	Place sample/calcium carbonate into dilute hydrochloric acid Bubble gas produced through limewater Limewater turns cloudy/milky	[3]	
Total			55