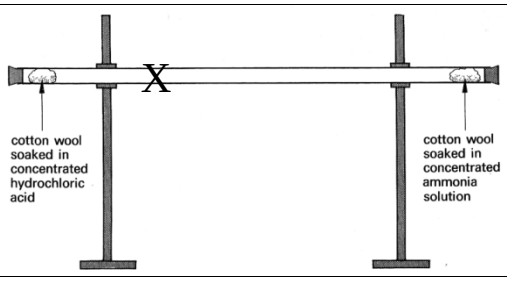
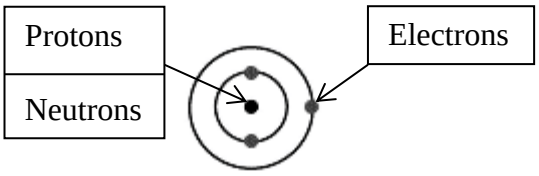
DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department of Curriculum Management
Educational Assessment Unit

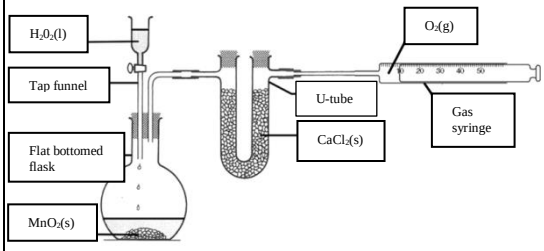
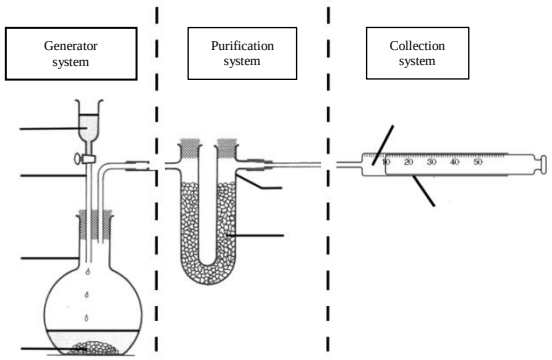
Track 2

Annual Examinations for Secondary Schools 2014

FORM 3 CHEMISTRY MARKING SCHEME

Question		Requirement	Marks	Additional Guidelines
1a	i)	Mg	1	
	ii)	Fe	1	
	iii)	KCl	1	
	iv)	$CaSO_4$	1	
	v)	$Al(NO_3)_3$	1	
1b	i)	Test tube	1	
	ii)	Beaker	1	
	iii)	Bunsen burner	1	
	iv)	Evaporating basin / dish	1	
	v)	Liebig condenser	1	Accept: condenser.
2a		fixed	1	
2b		solid melting	2	
2c		state liquid	2	
2d		vibrate	1	
2e		rise boiling	2	
2f		gaseous	1	
2g		random	1	
3a		Rust	1	
3b	i)	Water	1	½ mark for each item
	ii)	Oxygen		
3c	i)	Painting	1	
	ii)	Galvanisation	1	
	iii)	The Zn coating is heat resistant	1	Accept any reasonable answer.
3d		$C + O_2 \rightarrow CO_2$	2	1 mark for correct chemical formulae 1 mark for correct balancing
3e		No	1	
3f		Burning charcoal indoors increases the risk of producing poisonous CO due to the lack of oxygen.	2	1 mark for mentioning the production of CO due to lack of O_2 1 mark for saying it is poisonous

4a	i)	Diffusion	1	
	ii)		1	Accept any position for X as long as it is to the left of the centre of the tube.
	iii)	1. HCl gas is heavier than NH_3 gas 2. HCl diffuses at a slower rate than NH_3	2	
	iv)	A white ring is formed.	1	Accept: white solid is formed.
4b	i)		2	½ mark for **any** correct structure ½ mark for **each** correct label
	ii)	Isotopes are atoms that have the same number of protons but different number of neutrons.	1	Accept any correct version.
	iii)	RAM = (24x78.99) + (25x10.00) + (26x11.01) = 2432 / 100 = **24.32**	2	1 mark for correct working 1 mark for correct answer and unit
5a	i)	No	1	
	ii)	Use a pH meter / pH paper	1	Accept any method of checking pH as long as it does not contaminate the water.
	iii)	Limestone, $CaCO_3$	1	
	iv)	• It neutralises the acid by reacting with it. • It does not dissolve in water.	2	
5b	i)	Neutralisation is a reaction between an acid and a base to produce a salt and water only.	1	
	ii)	$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$	2	1 mark for correct chemical formulae 1 mark for correct balancing
5c	i)	When no further bubbles are produced	1	
	ii)	Carbon dioxide	1	
6a	i)	2, 1, 3.	1	
	ii)	Amount in moles = 1 g/63.5 = 0.01575 mol	2	1 mark for correct working 1 mark for correct answer and unit
6b		Because unlike the beaker it can withstand high temperatures	1	
6c	i)	To make sure all the copper has reacted completely	1	
	ii)	Mass of O = 1.252 – 1 = 0.252 g	1	
	iii)	Amt. mol of O = 0.252/16 = 0.01575 mol Cu:O = 0.01575 : 0.01575 = **1:1**	2	1 mark for correct working 1 mark for correct answer

6d		Empirical mass = 79.5, therefore chemical formula = empirical formula = **CuO**	1	
6e		% by mass = (0.252/1.252)x100 = **20.13 %**	1	
7a		It acts as a catalyst.	1	
7b		**2**$H_2O_2(l) \rightarrow 2H_2O($**l**$) + O_2(g)$	3	
7c		To make steel and in hospitals	2	Accept other correct uses.
7d			8	1 mark for each label
7e			4	1 mark for placement of each label 1 mark for placement of dotted lines
7f		When a glowing splint is placed into a test tube full of oxygen, the splint relights.	2	1 mark for test 1 mark for result
8a		Sublimation	1	
8b	i)	Beaker, filter funnel, Bunsen burner, tripod	2	½ a mark for each item
	ii)	1. Put the mixture in the crucible and place it on a tripod. 2. Cover the crucible with an inverted funnel. 3. Heat the mixture until no more fumes come from the mixture.	3	
	iii)	The heat resistant substance remains in the beaker while the substance that sublimes should now be present on the inverted funnel.	2	
8c	i)	Miscible means that two liquids mix well together.	1	
	ii)	Water and ethanol	1	
	iii)	Fractional distillation	1	

	iv)	A – Bunsen burner B – Round bottomed flask C – Fractionating column D – Thermometer E – Liebig condenser F – Distillate	6	
	v)	C or fractionating tower	1	
	vi)	Water	1	
	vii)	To condense a vapour to liquid	1	
9a	i)	Water vapour	1	
	ii)	It absorbs the water vapour, keeping the bicarbonate dry.	1	Accept: to help the powder flow freely.
	iii)	No, as it needs to be edible.	2	Accept: it must not be poisonous.
9b	i)	Filtration	1	
	ii)	A – Stand and clamp B – Mixture C – Filter paper D – Residue E – Funnel F – Filtrate	6	1 mark for each label
	iii)	➢ Using the beaker, add distilled water to the sample and stir with the stirrer.	1	
	iv)	➢ Wash the residue with distilled water.	1	
	v)	➢ Weigh the filter paper and anti-caking agent and then calculate the percentage of anti-caking agent in the baking powder sample.	1	
	vi)	• Mass of the sample of baking powder • Mass of the anti-caking agent	2	
9c	i)	4.5 %	2	1 mark for correct working 1 mark for correct answer
	ii)	The sample of baking powder is not dry.	2	Award marks if students say that the baking powder might have other substances mixed with it.