

CHEMISTRY FORM 2

OPENER ASSESSMENTS TERM 2 2023

MARKING SCHEME

QNS	RESPONSE	MRKS
1a	Thistle funnel is not inserted in the solution. This can lead to escape of gas prepared	1mk
1b	less denser than air	1mk
1c	$Zn_{(s)} + H_2SO_{4(aq)} \rightarrow ZnSO_{4aq} + H_{2g}$	1mk
2	Iron nail coated with tin will rust while the iron nail coated with zinc will not rust. Iron is more reactive than tin and will lead to rusting while zinc is more reactive than iron	1mk 1mk
3a	manganese(IV)oxide	1mk
3b	$2H_2O_{2(l)} \rightarrow 2H_2O_{(l)} + O_{2(g)}$	1mk
3c	1. Oxygen is used to burn fuels such as those used for propelling rockets. 2. A mixture of oxygen and acetylene burns to produce a very hot flame used in welding and for cutting metals. 3. During steel making, oxygen is used to remove iron impurities. 4. Oxygen is used as one of the reactants in fuel cells.	2mk any 2
4a	Period 3 group V	
4b	Y^{3-}	
4c	Ionic radius is larger than its atomic radius Element Y forms its ion by gaining 3 electrons. the incoming electrons increases repulsion of electrons in energy level hence increasing the size if the ion	1mk 1mk
5	let percentages be x% and y% $6x + 7y = 694$ $x + y = 100$ $x = 100 - y$ $6(100 - y) + 7y = 694$ $y = 94\%$, $x = 6\%$	
6	Proton are positively charged while electrons are negatively charged Protons have atomic mass unit of 1 while electrons have negligible atomic mass unit (1/1840)	2mks
7a	Increase the surface area for the vapour of liquid whose boiling point has not been reached to condense and flowback to the round bottomed flask	1mk
7b	Methanol It has a lower boiling point compared to propanol	2mks
7c	condensation will take place but not efficitly	1mk
8a	their outermost energy levels are completely filled with electrons hence they do not lose or gain electrons under ordinary conditions	
8b	comparatively alkaline earth metals have smaller atomic radius than alkali metals/they have stronger nuclear charge than alkali metals	2mks

	Hence they do not loss electrons easily	
9a	P and S	1mk
9b	Q	1mk
10 I	Concentrated sodium hydroxide solution/concentrated potassium hydroxide solution	
10 Ii	Cool the air to -25°C vapour is condensed and frozen to solid ice	2mk
Iii	-200°C	1mk
Iv	Nitrogen \rightarrow Argon \rightarrow oxygen	1mk
11i	Starts to boil at 100°C to 108°C . it boils at a range of temperature	1mk
Ii	Impure water It boils at a range of temperature	2mk
Iii	Raises the boiling point Boils at a range of temperature	2mks
Iv	Lowers the boiling point Melts at a range of temperature	2mks
12a	In i) magnesium combine chemically with oxygen gas While in air magnesium combine chemically with both oxygen and nitrogen gas	2mks
B	$2\text{Mg}_{(s)} + \text{O}_{2(g)} \rightarrow 2\text{MgO}_{(s)}$ $3\text{Mg}_{(s)} + \text{N}_{2(g)} \rightarrow \text{Mg}_3\text{N}_{2(s)}$	2mk
13a	The active part of air(oxygen) has been used up for rusting. No more reaction rusting	2mk
B	$(1000-800)/1000=0.02$ $0.02/100=20\%$	2mk
14	The components of air are not chemically combined and can separated through physical means The components of air maintain their physical properties	2mk
15	i) 20 ii)R iii)W,V,R iv)react by gaining electron hence electron repulsion in the energy levels increases	5mks
16	i) $2\text{Fe}_2\text{O}_{3(s)} + 6\text{CO}_{(g)} \rightarrow 4\text{Fe}_{(s)} + 6\text{CO}_{2(g)}$ ii) Oxidizing Fe_2O_3 , reducing $\text{CO}_{(g)}$ iii)Extraction of metals, Electroplating	5mks
17	a). It sublimates without leaving wetness b) it is a better coolant at -78°C compared to ice 0°C It sublimates without leaving wetness c) Aluminium chloride, iron(III) chloride, iodine, Benzoic acid d) freeze drying to preserve food products	5mk
18a	$33 \times 2 + (30 \times 1) = 96$ $96 / 3 = 32$	2mks
B	$30 + 35 = 65$	
C	30	
19	Darts on the surface of water, hissing sound, melt into silvery ball	3mks
20	a) Q it has 4 occupied energy levels b) Q it has the largest atomic radius hence highest tendency to lose valence electrons	
	Totals	80mks

