



Rewarding Learning

General Certificate of Secondary Education
2010–2011

Science: Single Award (Modular)

Chemical Patterns and our Environment
Module 3

Higher Tier

[GSC32]

WEDNESDAY 23 FEBRUARY 2011, MORNING

**MARK
SCHEME**

		AVAILABLE MARKS
1	(a) A: colour of solution – colourless/pale blue [1] metal – reddish brown [1]	8
	B: colour of solution – colourless [1] metal – grey [1]	
	(b) iron is less reactive than zinc [1] it is unable to displace it/no reaction [1]	
	(c) displacement [1]	
	(d) zinc sulphate [1]	
2	(a) all points plotted correctly [2] 5, 6 correct [1] line joining points [1]	10
	(b) to get more reliable results [1]	
	(c) safety glasses [1]	
	(d) $\text{MgCO}_3 \longrightarrow \text{MgO} + \text{CO}_2$ [1] [1]	
	(e) (i) thermal [1] decomposition [1] [2] (ii) 4.4g [1]	
3	(a) (i) electron [1]	7
	(ii) neutron [1]	
	(iii) proton [1]	
	(b) carbon [1]	
	(c) proton mass 1 neutron charge 0 electron charge –1 [3]	

		AVAILABLE MARKS	
4	(a) (i) to stop fats from going rancid or off	[1]	
	(ii) to keep the pH at the right level	[1]	
	(iii) to make food more attractive	[1]	
	(b) migraines, hyperactivity, cancer, allergies (not just health) any two	[2]	
4	(c) Advantages: safer than testing on humans may warn of harm to humans		
	Disadvantages: animals may suffer animals cannot say no animals may react differently to humans		
	Must give at least one advantage and one disadvantage	[3]	
5	(a) rocks [1] contain elements which are radioactive [1] the half life of these elements can be measured [1] uranium and potassium isotopes can be used [1] presence of daughter nuclei [1] any three	[3]	
	(b) (i) Archbishop Ussher	[1]	
	(ii) 6 000 years	[1]	
6	(a) (i) Al 2 [1] S 3 [1] O 12 [1]	[3]	
	(ii) 4	[1]	
	(b) $\text{Mg(OH)}_2 + 2\text{HCl} \rightarrow \text{MgCl}_2 + 2\text{H}_2\text{O}$ [1] for MgCl_2 , [1] for H_2O , [1] for correct balancing	[3]	
Total			45