

RATE OF REACTION 3

MARK SCHEME

Q1.

Question	Answer	Extra information	Marks
(a)	1		1
(b)	2		1
(c)	3		1
(d)	4		1
Total marks			4

Q2.

Question	Answer	Extra information	Marks
(a)	time from when the heating is started until the limewater turns cloudy / milky		1
(i)	the temperature was not high enough the bubbles of gas were air	accept the copper carbonate had not started to decompose / react accept it takes time to heat up the copper carbonate accept no carbon dioxide produced	1 1
(ii)	the copper carbonate was decomposing / reacting so carbon dioxide was produced	accept the temperature was high enough to cause decomposition / a reaction allow correct word / symbol equation	1 1
(iii)	copper oxide was produced because the copper carbonate had completely decomposed / reacted	allow correct word / symbol equation ignore all of the carbon dioxide had been given off	1 1
Total marks			8

Q3.

Question	Answer	Extra information	Marks
	<p>any three from:</p> <p>(after about 4 minutes) the sulfuric acid stops reacting or nitric acid continues to react</p> <p>(initially) the reaction with sulfuric acid is faster</p> <p>(the reaction stops) because calcium sulfate is a solid</p> <p>(the reaction continues) because calcium nitrate is soluble / in solution / aqueous</p> <p>because the calcium sulfate prevents the sulfuric acid reacting with the calcium carbonate</p> <p>(the rate is faster) because sulfuric acid contains two hydrogens</p>	<p>accept more CO₂ with nitric acid at any time after 4 minutes</p> <p>allow sulfuric acid produces a solid</p> <p>allow nitric acid produces an (aqueous) solution</p>	3
Total marks			3

Q4.

Question	Answer	Extra information	Marks
(i)	react	<p>allow neutralise</p> <p>allow bubbles / fizzes</p> <p>accept produces gas / CO₂</p> <p>ignore rises</p>	1
(ii)	<p>stop reacting / producing</p> <p>the (hydrochloric) acid / (calcium) carbonate is used up</p> <p>OR</p> <p>have been used up (1)</p> <p>the graph line becomes horizontal / levels out (1)</p> <p>OR</p> <p>stays the same / no change (1)</p> <p>no further reaction (1)</p>	<p>stops on its own is insufficient</p> <p>allow stop working / bubbling / fizzing</p> <p>accept because the (calcium) carbonate has neutralised the (hydrochloric) acid</p> <p>ignore reference to graph line</p>	1 1
Total marks			3