

Factors Affecting Rate

Q1. (2018) – 3c (iii), 3d

A)

Question Number	Answer	Additional guidance	Mark
3(c)(iii)	powder / cut up / break up / use smaller pieces	ignore reference to surface area/ squash / flatten	(1) AO 1 2

B)

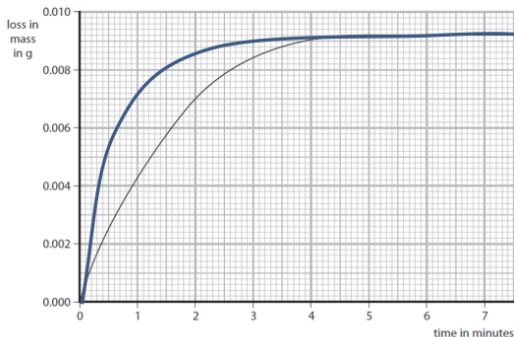
Question Number	Answer	Additional guidance	Mark
3(d)	• slower • slower • unchanged all 3 rows correct – 2 marks one or two rows correct – 1 mark	may indicate correct answer in any way e.g. by underlining do not credit a row if more than one answer is indicated in a row	(2) AO 1 1

Q2. (2019) – 6d, 6e

A)

Question number	Answer	Additional guidance	Mark
6(d)	(mass loss will be) greater (1)	Allow more gas Ignore references to reaction rate	(1)

B)

Question number	Answer	Additional guidance	Mark
6(e)	 (2)	line drawn with steeper gradient to left of line (1) levelling off at the same height as the existing line (1)	(2)

Q3. (2020)

Question number	Answer	Additional guidance	Mark
9(a)(i)	larger surface area {higher /faster} rate /ORA	answer must be comparative	(1)

Q4. (2020) – 9b

Question number	Indicative content	Mark
*9(b)	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material that is indicated as relevant. Additional content included in the response must be scientific and relevant. A plan to include some of the following points • measure equal masses of zinc using balance • measure equal volumes of acid using measuring cylinder/pipette/suitable named piece of apparatus • pour acid in suitable container • record initial temperature • use of thermometer • add zinc to acid • place bung with delivery tube in container / reaction vessel immediately after the zinc is added • use of timer • start timer on addition of zinc • measure volume of gas evolved using a delivery tube and inverted measuring cylinder/burette over water OR delivery tube and (gas) syringe • record time to collect fixed volume of gas • record final/highest temperature • calculate the temperature increase • repeat for procedure • same initial temperature • same size pieces of zinc • same volume of acid credit use a suitable labelled diagram of apparatus for rate measurement/ temperature of acid	(6)

Q5. (2021)

Question number	Answer	Mark
2(a)	any two from: concentration of acid (1) {size / shape / surface area / length} area of magnesium ribbon (1) mass of magnesium (1)	(2) AO2

Q6. (2022) – 8b (ii), 8c

A)

Question number	Answer	Mark
8(b)(ii)	D use the same metal but in a powdered form is the only correct answer B and C are incorrect because the reactants are not changed A is incorrect because the reaction will be slower	(1) AO2 1

B)

Question number	Answer	Additional guidance	Mark
8(c)	A description including any two from: {crush/ break} the large chips (1) - in pestle and mortar (1) - use sieves to separate different sized chips/ sort the chips by size (1)	ignore {cut / chop} them up ignore breaking down by cutting / chopping / tearing / heating etc allow any suitable <u>laboratory</u> apparatus/ tool e.g. hammer ignore domestic equipment e.g. scissors / rolling pin allow leave in acid (to reduce size) for MP2 but MP1 cannot score allow pick out the sizes you need allow repeat the method to get even smaller chips	(2) AO1 2

Q7. (2023) – 8c, 8d

A)

Question number	Answer	Additional guidance	Mark
8(c)	graph to show - initial line steeper and to the left (1) - line levelling off at 100 cm³ before 5 minutes (1)	there must be a line from part (a) to award these marks. if lines are not labelled, make a reasonable assumption about which is C. mark independently. line should start from start of original line all levelling off within half a square of original line	(2) AO3-2

B)

Question number	Answer	Mark
8(d)	C use a more concentrated acid is the only correct answer A, B and D will have no effect on the speed of reaction	(1) AO1-2

Q8. (2024) – 8c

A)

Question number	Answer	Additional guidance	Mark
8(c)	An explanation linking - rate is increased (1) - because higher surface area/ higher frequency of collisions/ more collisions <u>per second</u> (1)	If rate decreased scores 0 for whole answer allow (rate/ reaction) faster, quicker, speed of reaction increases allow reaction takes less time/ dissolves faster reject particles have more energy for MP2 allow more area (of marble) for reactions to occur/ more contact allow more chance of collisions/ collisions happen more often ignore more (successful) collisions alone	(2) AO1 1

B)

Question number	Answer	Mark
8(d)	B using acid of a lower concentration is the only correct answer C is incorrect because the reactants are not changed A and D are incorrect because the reaction will be faster	(1) AO1 2