17 Rate of Reactions

Set A **Foundations**

Name	Time 30 minutes	Total 13 marks	Score ____ / 13

Use a copy of the Periodic Table where you need one.

A From the lesson

7 MARKS

1 Marble chips react with excess dilute hydrochloric acid. Why does the graph of volume of gas against time level off?

A The catalyst has been used up.
B The marble chips have all reacted.
C The acid has evaporated.
D The gas has stopped dissolving.

Answer ☐ [1]

/1

Source: Learners' Alley, Rate of Reactions slides

2 Which change does **not** increase the rate of reaction between marble chips and dilute hydrochloric acid?

A using powdered marble
B warming the acid
C using a larger volume of the same acid
D using more concentrated acid

Answer ☐ [1]

/1

Source: Learners' Alley, Rate of Reactions slides

3 Answer these questions about rates of reaction.

(a) Name two quantities that can be measured to follow the rate of a reaction that gives off a gas.

..... [1]

(b) What is an effective collision?

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..... [1]

(c) Define a catalyst.

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(d) Explain why a higher temperature increases the rate of a reaction.

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[2]

Source: Learners' Alley, Rate of Reactions slides

B Practice

6 MARKS

4 For which reaction is pressure **least** likely to affect the speed of reaction?

A $C(s) + CO_2(g) \rightarrow 2CO(g)$

B $C_2H_4(g) + Br_2(l) \rightarrow C_2H_4Br_2(l)$

C $2Na(s) + 2H_2O(l) \rightarrow 2NaOH(aq) + H_2(g)$

D $2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$

/1 Answer [1]

Source: 2024 AMKSS Prelim P1 Q31

5 Potassium chlorate decomposes when heated: $2KClO_3(s) \rightarrow 2KCl(s) + 3O_2(g)$. Manganese(IV) oxide is a catalyst. In experiment 1, powdered manganese(IV) oxide is heated with 0.1 g of powdered potassium chlorate. In experiment 2, lumps of manganese(IV) oxide are heated with 0.2 g of powdered potassium chlorate. What are the initial rate and the final volume of oxygen in experiment 2, compared with experiment 1?

	initial rate of reaction	final volume of oxygen formed
A	faster than experiment 1	larger than experiment 1
B	faster than experiment 1	same as experiment 1
C	slower than experiment 1	larger than experiment 1
D	slower than experiment 1	same as experiment 1

/1 Answer [1]

Source: 2024 SJI Prelim P1 Q31

6 Aqueous hydrogen peroxide decomposes at room temperature to form water and oxygen. It decomposes faster when it is warmed and kept at 50 °C.

Use ideas about collisions between particles to explain why.

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[2]

Source: AES Prelim P2 A2(c)

7 Catalysts are used to speed up many reactions.

Explain, in terms of collisions and energy, the effect of a catalyst on the rate of a reaction.

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..... **[2]**

/2

Source: 2024 QTSS Prelim P2 A9(a)