

6.1 Chemical Kinetics

Question Paper

Course	DPIB Chemistry
Section	6. Chemical Kinetics
Topic	6.1 Chemical Kinetics
Difficulty	Easy

Time allowed: 40
Score: /33
Percentage: /100

Question 1a

a)

Describe kinetic theory in relation to energy and temperature.

[2]

[2 marks]**Question 1b**

b)

State what is required for a collision to result in a reaction.

[2]

[2 marks]**Question 1c**

c)

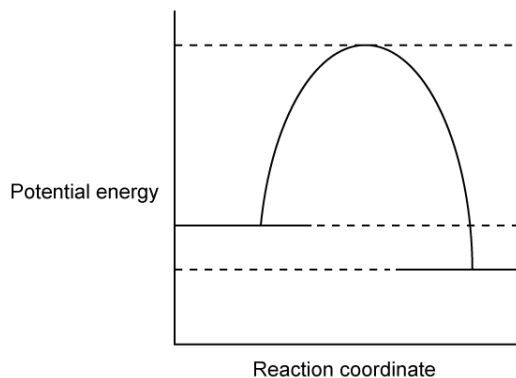
State the meaning of activation energy (E_a).

[2]

[2 marks]

Question 1d

d)
Label the activation energy on the energy profile diagram below.



[1]

[1 mark]

Question 2a

a)
State three ways of monitoring concentration changes in a reaction.

[3]

[3 marks]

Question 2b

b)
A reaction is monitored by measuring the volume of a gas produced every 10 seconds. State an appropriate unit to use.

[1]

[1 mark]

Question 2c

c)
Sketch a graph to show the volume of gas produced during the course of an experiment against the time taken.

[4]

[4 marks]

Question 2d

d)
State the effect that increasing concentration has on the rate of a reaction.

[1]

[1 mark]

Question 3a

a)
State the effect that increasing temperature has on the rate of a reaction.

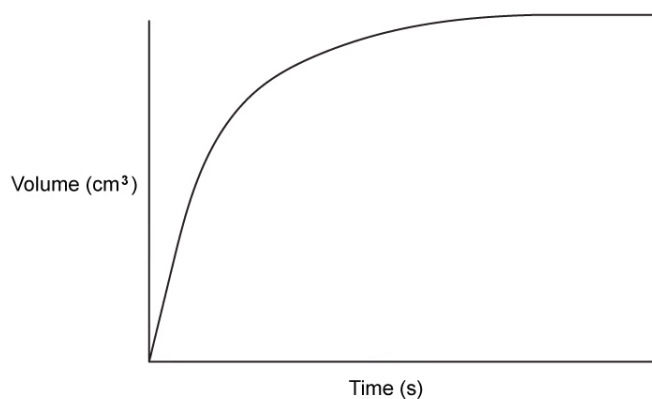
[1]

[1 mark]

Question 3b

b)

Sketch a line on the graph to show the same reaction occurring at a higher temperature.



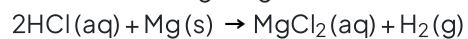
[3]

[3 marks]

Question 3c

c)

State two variables that need to be controlled when investigating the effect of temperature on rate in the following reaction:



[2]

[2 marks]

Question 3d

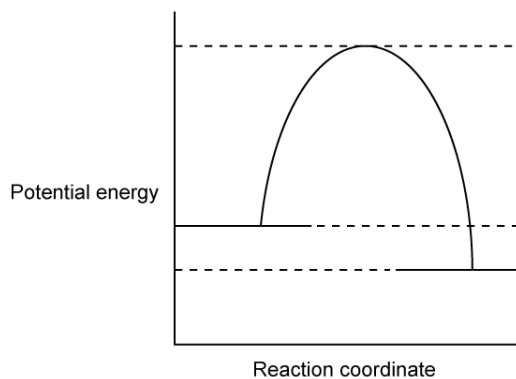
d)
Suggest an appropriate piece of equipment to use to measure the volume of H_2 gas produced in the reaction between HCl and Mg .

[1]

[1 mark]

Question 4a

a)
Sketch a line on the potential energy profile diagram to show the pathway for the same reaction, but with a catalyst.



[2]

[2 marks]

Question 4b

b)
Explain how catalysts work.

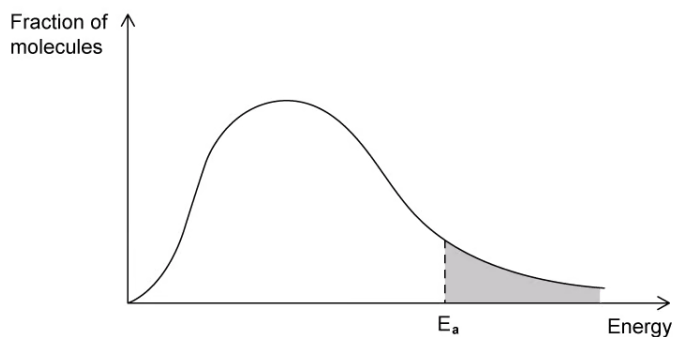
[3]

[3 marks]

Question 4c

c)

A Maxwell-Boltzmann distribution is shown below:



i)

Draw a line on the Maxwell-Boltzmann curve below to show the effect of adding a catalyst.

[1]

ii)

Shade in the area representing the number of particles that can react with the catalyst present.

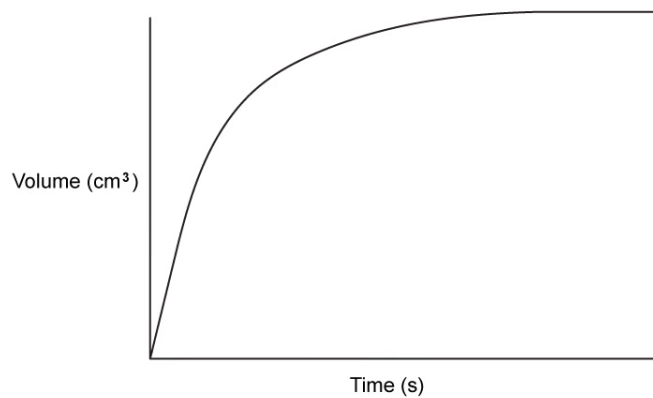
[1]

[2 marks]

Question 4d

d)

Sketch a line on the graph to show the same reaction occurring with a catalyst.



[3]

[3 marks]