Q1.

Which statement explains why the rate of a reaction increases when a catalyst is added to a reaction mixture at a constant temperature?

A The collision frequency increases because there is an increase in the activation energy. ⬭

B The collision frequency increases because there is an increase in the mean energy of the particles. ⬭

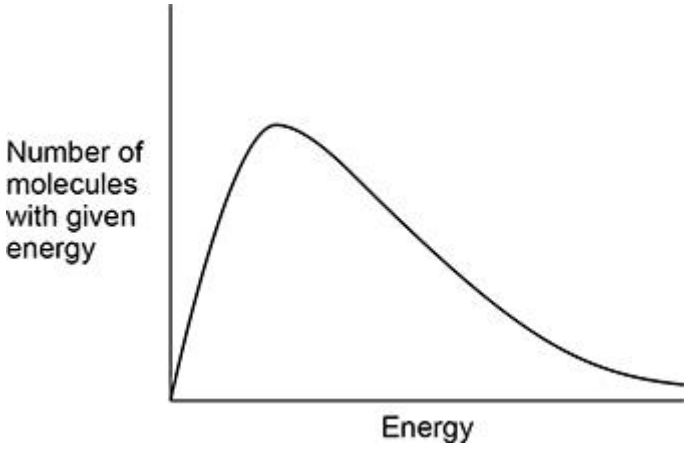
C The proportion of successful collisions increases because there is a decrease in the activation energy. ⬭

D The proportion of successful collisions increases because there is an increase in the mean energy of the particles. ⬭

(Total 1 marks)

Q2.

The Maxwell–Boltzmann distribution curve is shown for a gaseous reaction mixture.



What is represented by the total area under the curve?

A The total energy of the molecules in the reaction mixture ⬭

B The total energy of reacting molecules in the reaction mixture ⬭

C The total number of molecules in the reaction mixture ⬭

D The total number of reacting molecules in the reaction mixture ⬭

(Total 1 mark)

Q3.

Which statement explains why the rate of a reaction increases when a catalyst is added at a constant temperature?

A The collision frequency increases because there is a decrease in activation energy. ⬭

B The collision frequency increases because there is an increase in the average energy of the particles. ⬭

C The proportion of successful collisions increases because there is a decrease in activation energy. ⬭

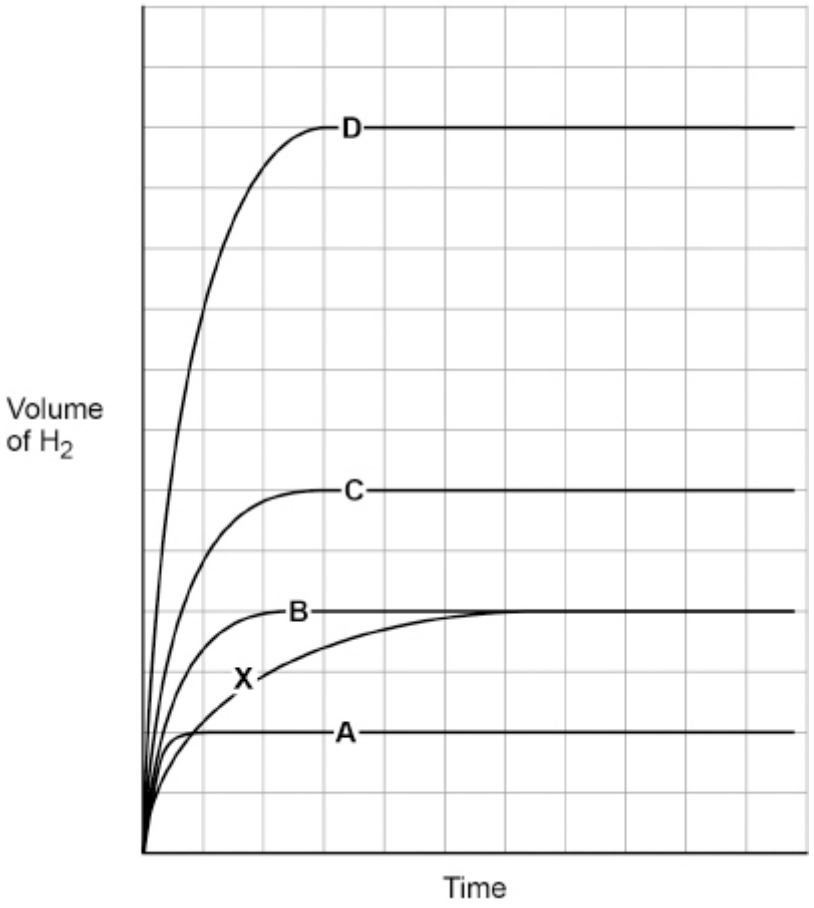
D The proportion of successful collisions increases because there is an increase in the average energy of the particles. ⬭

(Total 1 mark)

Q4.

Magnesium reacts with an acid to form hydrogen gas.

Line **X** on the graph shows how the volume of hydrogen gas varies with time when 50 cm^3 of 0.50 mol dm^{-3} acid reacts with an excess of magnesium.



The reaction is repeated under the same conditions but using 25 cm^3 of 1.50 mol dm^{-3} acid. The magnesium is in excess.

Which line represents this second reaction?

A line **A** ⬭

B line **B** ⬭

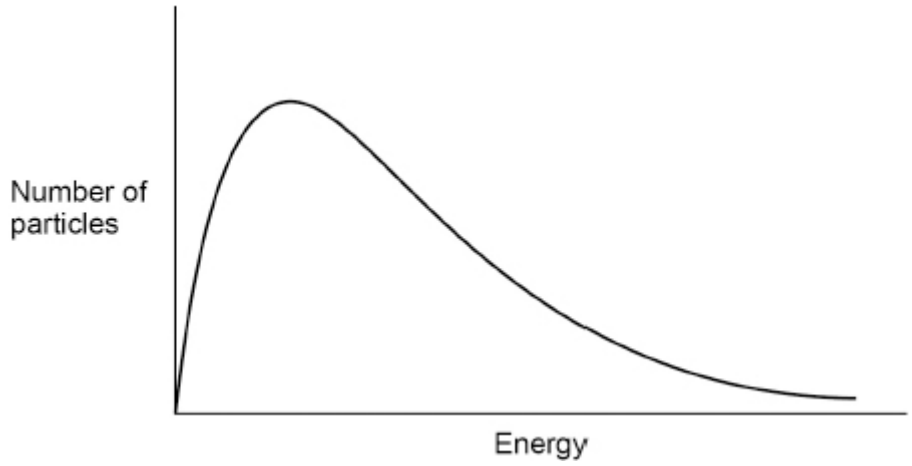
C line **C** ⬭

D line **D** ⬭

(Total 1 mark)

Q5.

This is a Maxwell–Boltzmann distribution for a gaseous reactant.



What is represented by the total area under the curve?

A total energy of the particles ⬭

B activation energy for the reaction ⬭

C total number of reacting particles ⬭

D total number of particles present ⬭

(Total 1 mark)

Q6.

The rate of reaction is greater when a catalyst is used, without changing the temperature.

Which statement explains why the rate of reaction is greater with a catalyst?

A The collision frequency increases because the catalysed reaction has a lower activation energy. ⬭

B The collision frequency increases because there is an increase in the average energy of the particles. ⬭

C The proportion of successful collisions increases because the catalysed reaction has a lower activation energy. ⬭

D The proportion of successful collisions increases because there is an increase in the average energy of the particles. ⬭

(Total 1 mark)

Q7.

Which statement about molecules in a gas is correct?

A At a fixed temperature they all move at the same speed. ○

B At a fixed temperature their average kinetic energy is constant. ○

C As temperature increases, there are more molecules with the most probable energy. ○

D As temperature decreases, there are fewer molecules with the mean energy. ○

(Total 1 mark)

Q8.

Consider the change that occurs in the shape of the curve for the distribution of molecular energies in a gas when the temperature of the gas is increased.

Which is a correct statement about the gas molecules at a higher temperature?

A There are more molecules with any given energy. ○

B There are more molecules with the mean energy. ○

C There are more molecules with the most probable energy. ○

D There is an increase in the most probable energy of the molecules. ○

(Total 1 mark)