

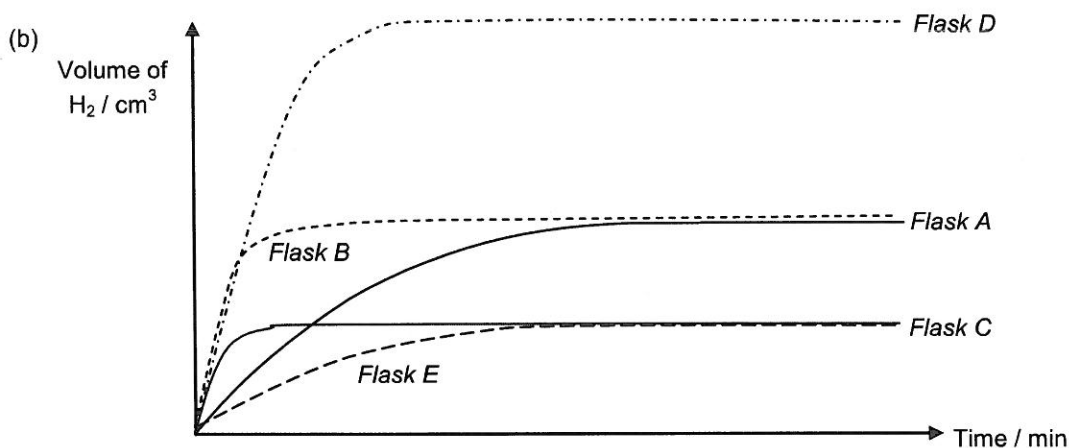
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7. Kinetics answers

7.1. Collision theory

1. $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$ (1 mark)

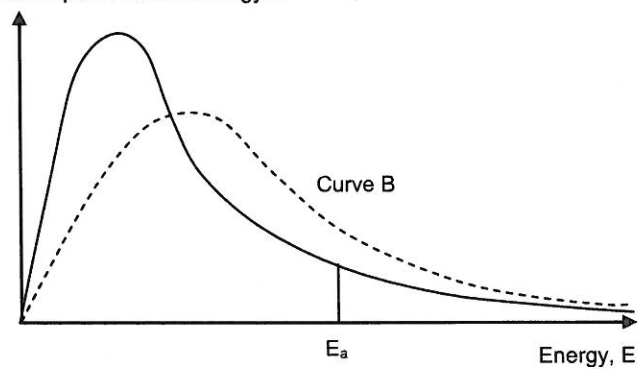
2. (a) Flask E would go the slowest. (1 mark)



(2 marks for each of the curves for flasks B, C, D and E; 1 for the correct initial gradient, 1 for the correct finishing point)

7.2.1. Sketching Maxwell-Boltzmann

1. No. of particles with energy E



1 mark – both axes correctly labelled

1 mark – curve starts at origin

1 mark – curve never touches x-axis

1 mark – correct shape

1 mark – drawing of E_a

2. For the drawing of curve B above;

1 mark – peak to the right of original curve

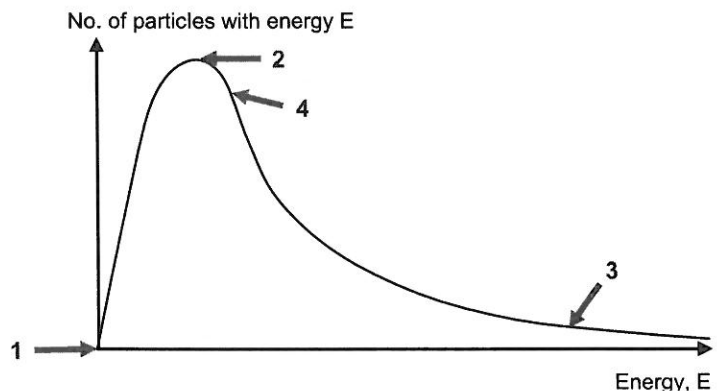
1 mark – peak height is lower

1 mark – approximately the same area under the two curves

3. At a higher temperature many more of the particles will have an energy greater than the activation energy (1 mark) resulting in a higher percentage of particle collisions resulting in a reaction (1 mark)

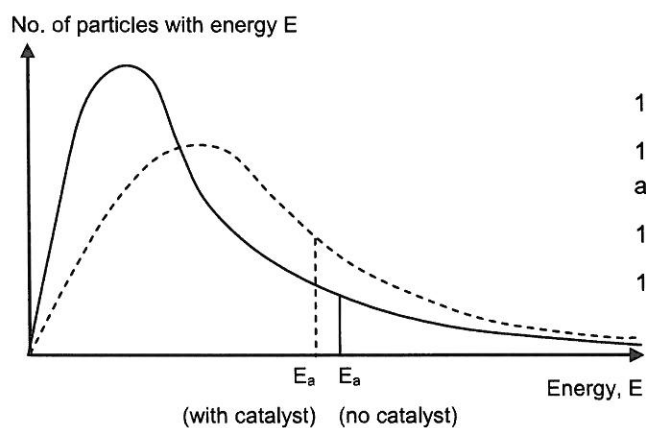
7.2.2. The Importance of Maxwell-Boltzmann

1.



(4 marks)

2. (a)



1 mark – approximate same area

1 mark – most probable energy is lower and to the right

1 mark – the lines never cross

1 mark – E_a lower in energy

(with catalyst) (no catalyst)

- (b) It is important that catalytic converter reaches its operating temperature quickly because at higher temperatures and with the catalyst active many more particles have sufficient energy to react. Hence the catalytic converter is much more efficient (removes more polluting gases) at operating temperature. (2 marks)