Answers to Unit 1.5 Exercises

Topic 5 Exercise 1

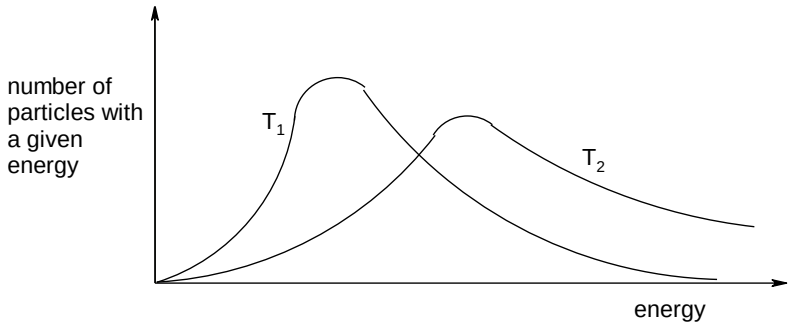
1. a) i) number of collisions between particles per second
   ii) combined energy of the colliding particles
   iii) minimum collision energy required for a collision to be successful

   b) Collisions only lead to a chemical reaction if the combined kinetic energy of the colliding particles is equal to or greater than the activation energy.

   c)

	Increase in concentration	Increase in pressure	Increase in temperature	Addition of catalyst
Collision Frequency	Increases	Increases	Increases	No change
Collision Energy	No change	No change	Increases	No change
Activation Energy	No change	No change	No change	Decreases

2. a)



on moving from T1 to T2

i) mean kinetic energy increases as particles are moving faster
ii) area under graph is the same as number of particles is the same
iii) number of particles having the most common amount of energy decreases as there is a greater spread of energies

b) the mean collision energy increases
so the chance of having a collision energy greater than the activation energy is much higher
so the fraction of successful collisions is much higher

3. a) a substance which changes the rate of a chemical reaction without itself being chemically unchanged at the end of the reaction.

b) a catalyst lowers the activation energy of the reaction by providing an alternative route for the reaction

c) if the activation energy is lower, the number of colliding particles with an energy greater than the activation energy will be higher
so the fraction of successful collisions will be higher