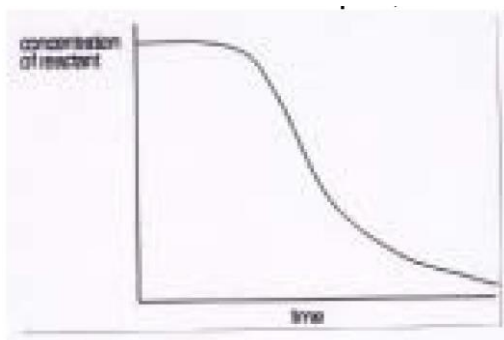


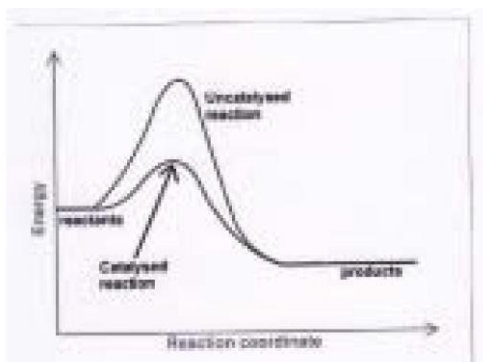
Goodluck!!

Topic 26 Most Common Questions

1. What is meant by homogeneous catalyst
 - Catalyst in the same physical phase as reactants that increases the rate of the reaction
2. What is meant by a heterogeneous catalyst
 - Catalyst that is in a different physical stage as the reactant and increases the rate of the reaction
3. Write the overall equation between $\text{S}_2\text{O}_8^{2-}$ and I^- and suggest why in the absence of a catalyst the activation energy is very high
 - $\text{S}_2\text{O}_8^{2-}(\text{aq}) + \text{I}^-(\text{aq}) \rightarrow \text{I}_2(\text{aq}) + 2\text{SO}_4^{2-}(\text{aq})$
 - The 2 negatively charged species repel each other
4. Write two equations to show how $\text{Fe}^{2+}(\text{aq})$ ions can catalyse the reaction between $\text{S}_2\text{O}_8^{2-}$ and I^-
 - Equation 1: $2\text{Fe}^{2+} + 2\text{I}^- \rightarrow 2\text{Fe}^{3+} + \text{I}_2$
 - Equation 2: $2\text{Fe}^{3+} + \text{S}_2\text{O}_8^{2-} \rightarrow 2\text{Fe}^{2+} + 2\text{SO}_4^{2-}$
5. Balance the equation for the reaction between acidified manganate ions and ethanedioic acid
 - $2\text{MnO}_4^- + 16\text{H}^+ + 5(\text{CO}_2\text{H})_2 \rightarrow 2\text{Mn}^{2+} + 10\text{CO}_2 + 8\text{H}_2\text{O}$
6. Sketch the curve for the autocatalysed reaction



- As the reaction progresses the amount of products increases while the amount of reactants decreases, since the products contain the catalyst, as the reaction progresses the rate increases, hence the curve becomes steeper
7. Describe with the aid of a reaction pathway diagram the effect of a catalyst in a reversible reaction. Suggest why catalysts are used in industrial processes



- Catalysts lower the activation energy of both forward and backwards reactions
- The process requires less energy and can work at lower temperatures

8. Type of catalyst for each reaction

catalysed reaction	heterogeneous	homogeneous
manufacture of ammonia in the Haber process	✓	
removal of nitrogen oxides from car exhausts	✓	
oxidation of sulfur dioxide in the atmosphere		✓

9. Suggest how the electrical conductivity will change as the reaction proceeds

- Conductivity decreases during the reaction. Number of X ions are decreased

10. Explain what is meant by order of reaction

- The power to which the concentration of a reactant is raised to in an equation

11. By considering the rate equation, explain why the rate decreases with decreasing temperature

- K decreases

12. By considering the rate equation, explain why the rate increases with increasing temperature

- K increases

13. State what is meant by the term rate-determining step

- It is the slowest step in a multi-step reaction

14. Define the term half life

- Time for amount or mass or concentration to halve

15. Identify a change taking place in the reactive mixture that would enable measurements of the rate of this reaction to be made.

- colorimeters / change in color