

Chem12 Kinetics : Test-70

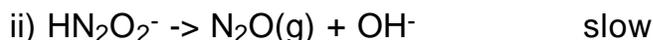
1) What is the basic premise of collision theory?

2) Define : reaction rate -

3) Given the reaction : $3\text{I}^- + \text{S}_2\text{O}_8^{2-} \rightarrow \text{I}_3^- + 2\text{SO}_4^{2-}$

If $[\text{I}_3^-]$ changes from 0.00000M to 0.00076M in 20. seconds, find the rate at which $[\text{I}^-]$ decreases.

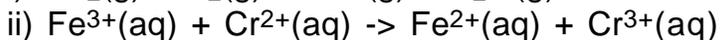
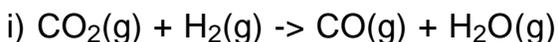
4)a) Find the overall reaction



b) Which step would you use a catalyst for?

c) If a catalyst is added, what happens to ΔH for the overall reaction?

5) Given the following reactions



a) Which is fastest?

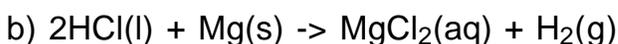
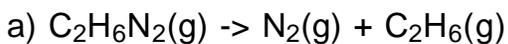
b) Which is slowest?

6) Give four ways to speed up a reaction.

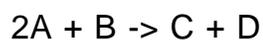
7) At room temperature the reaction : $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}(\text{g})$ does not occur despite a high frequency of collisions and favorable collision geometry. Why?

8) Explain in terms of collision theory why increasing the temperature increases the rate of a reaction.

9) How would you measure the reaction rate in a closed container; i.e., which physical quantity would you measure?



10) The following data were collected for the reaction



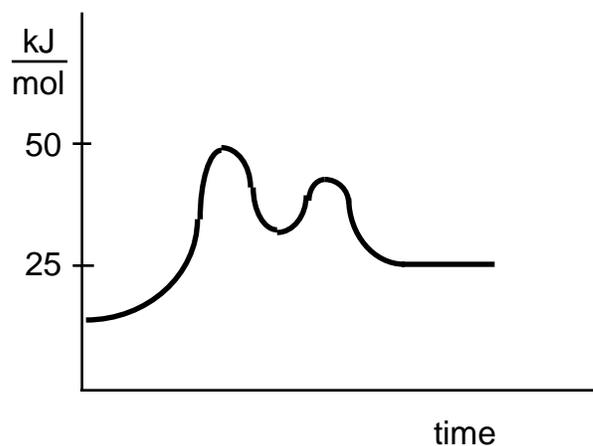
[A]	[B]	rate (mol/L/s)
0.10	0.10	0.00020
0.10	0.20	0.00040
0.20	0.20	0.0016
0.30	0.20	0.0036

a) The rate law is : $R = \underline{\hspace{2cm}}$

b) The rate constant is : $\underline{\hspace{2cm}}$

c) The order of the reaction is : $\underline{\hspace{2cm}}$

11) Answer the following questions based on the diagram below. (Give the approximate answer in kJ)



- a) The potential energy of the products = _____
- b) The potential energy of the reactants = _____
- c) The P.E. of reaction intermediate = _____
- d) The activation energy for the forward reaction = _____
- e) ΔH for the forward reaction = _____
- f) ΔH for the reverse reaction = _____

Answers : 1) Collisions between reactant molecules must occur before a reaction can take place. 2) $\Delta(\text{reactants or products})/\Delta\text{time}$, 3) $1.1 \times 10^{-4} \text{ mol/s}$, 4) a) $\text{H}_2\text{N}_2\text{O}_2 \rightarrow \text{N}_2\text{O} + \text{H}_2\text{O}$, b) ii), c) nothing, 5) a) ii), b) iii, 6) increase T, increase concentration of reactants, increase surface area of reactants, add a catalyst. 7) T is too low. Activation energy is too small. 8) It increases the collision rate which increases the reaction rate. 9) a) Pressure, b) Pressure or Mg(s) mass, 10) a) $R = k[\text{A}]^2[\text{B}]$, b) 0.20, c) 3, 11) a) 25, b) 13, c) 30., d) 37, e) +12, f) -12.