



CLASS 12 BATCH

FOR CHEMISTRY

LECTURE - 07

CHEMICAL KINETICS



Today's Goal



Temperature dependence Arrhenius equation



Temperature dependence of Rate and Rate Constant



Experimentally it has been found that the rate (or rate constant) of a chemical reaction is 2 to 3 times per 10°C increase in temperature





If T.C is 2 then Calculate rate of Rxn at 60°C is at 20°C the rate of reaction is r ?





If Temperature coefficient of a reaction is 3. How many times the rate of reaction would increase if temperature is raised by 30 K :



3



27



9



81



Arrhenius Equation



Activation Energy (E_a)



Graphs





Relation between K_1 and K_2





The slope of $\frac{-Ea}{2.303R}$ is obtained by the plot of

A $\log K \quad v/s \log A$

B $\log K \quad v/s T$

C $\log K \quad v/s \frac{1}{T}$

D $K \quad v/s \frac{1}{T}$





For a first order reaction rate constant is $1 \times 10^{-5} \text{ sec}^{-1}$ having $E_a = 1800 \text{ KJ/mol}$. Then value of $\log A$ at $T = 600 \text{ K}$ is:



151.7



349.3



24.7



11.34





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$\frac{k_{35^{\circ}\text{C}}}{k_{34^{\circ}\text{C}}} > 1$, this means that:



-  Rate increases with the rise in temperature
-  Rate decreases with rise in temperature
-  Rate does not change with rise in temperature
-  None of the above





The plot of $\ln k$ versus $1/T$ is linear with slope of:



$-E_a/R$



E_a/R



$E_a/2.303R$



$-E_a/2.303R$





Rate constant for a chemical reaction takes place at 500 K is expressed as $k = A \cdot e^{-1000}$. The activation energy of the reaction is:



100 cal/mol



1000 kcal/mol



10^4 kcal/mol



10^6 kcal/mol





On increasing temperature from 200K to 220K rate constant of A increases by 3 times and rate constant of B increases by 9 times then correct relationship between activation energy of A and B is



$$E_A = E_B$$



$$3E_A = E_B$$



$$E_B = 2E_A$$



$$E_A = 3E_B$$





When ethyl acetate was hydrolyzed in presence of 0.1 M HCl, the rate constant was found to be $5.4 \times 10^{-5} \text{ s}^{-1}$. But in presence of 0.1 M H_2SO_4 the rate constant was found to be $6.25 \times 10^{-5} \text{ s}^{-1}$. Thus it may be concluded that:



H_2SO_4 furnishes more H^+ than HCl



H_2SO_4 furnishes less H^+ than HCl



Both have the same strength

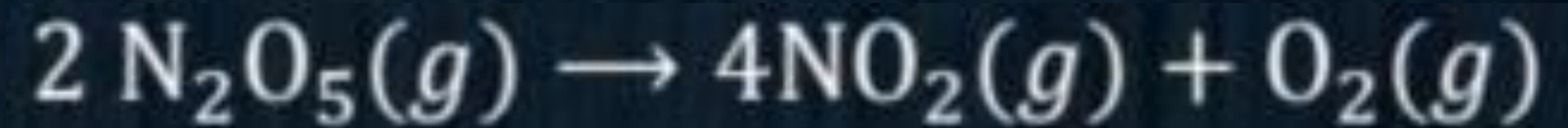


Will depend on concentration of ethyl acetate





The molecularity of a complex reaction given below is:



1



3



2



Has no meaning





THANK YOU !!

Homework

REVISE FORMULA OF LAST CHAPTER
DPP Of this Lecture

