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

Q 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 :

A 3

B 9

C 27

D 81

Arrhenius Equation

Activation Energy (E_a)

Graphs

Relation between K_1 and K_2

Q

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

A. log K v/s log A

B. log K v/s T

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

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

Q

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

A 151.7

B 349.3

C 24.7

D 11.34

Q

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C 24.7

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Q

$\frac{k_{35^0c}}{k_{34^0c}} > 1$, this means that:

A. Rate increases with the rise in temperature

B. Rate decreases with rise in temperature

C. Rate does not change with rise in temperature

D. None of the above

Q

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

A $-E_a/R$

B E_a/R

C $E_a/2.303R$

D $-E_a/2.303R$

Q

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

A 100 cal/mol

B 1000 kcal/mol

C 10^4 kcal/mol

D 10^6 kcal/mol

Q

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

A $E_A = E_B$

B $3E_A = E_B$

C $E_B = 2E_A$

D $E_A = 3E_B$

Q

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

A. H_2SO_4 furnishes more H^+ than HCl

B. H_2SO_4 furnishes less H^+ than HCl

C. Both have the same strength

D. Will depend on concentration of ethyl acetate

Q The molecularity of a complex reaction given below is:

$$2\,N_2O_5(g) \longrightarrow 4NO_2(g) + O_2(g)$$

A 1

B 2

C 3

D Has no meaning

THANK YOU !!

Homework

REVISE FORMULA OF LAST CHAPTER

DPP Of this Lecture