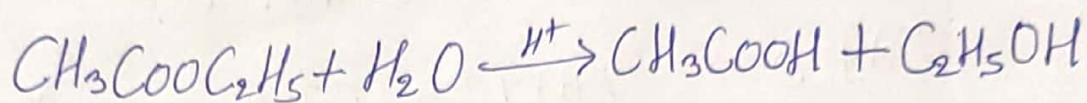


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12. PSEUDO UNIMOLECULAR REACTION:-

Consider the reaction:



Since water is present in large excess, its concentration hardly changes during the course of the reaction. And as such rate depends only on the concentration of ester. The order is one but the molecularity is two. Such reactions are called pseudo unimolecular reaction.

Ex 16. For a chemical reaction, $A \rightarrow \text{products}$, the rate of reaction doubles when the concentration of A is increased by 4 times. The order of reaction is

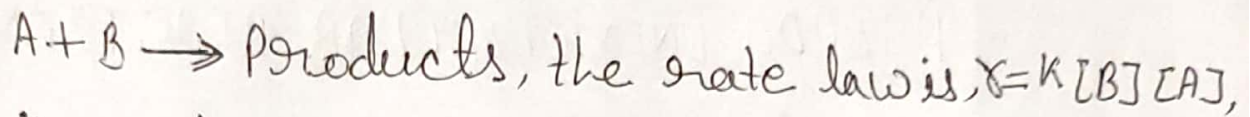
[A] 4 [B] 0 [C] $\frac{1}{2}$ [D] 1

Solⁿ Let $r = k[A]^n$ (i) ; $2r = k[4A]^n$ (ii)

$$\text{Dividing (ii) by (i)} \quad \frac{2x}{x} = \frac{k}{k} \left[\frac{4A}{A} \right]^n$$

$$\text{or } 2 = 2^{2n} \quad \text{or } 2n = 1 \quad \text{or } n = \frac{1}{2}$$

Ex. 17 For a hypothetical reaction



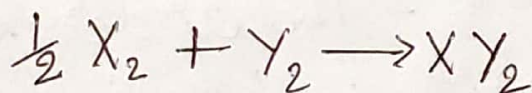
the order of reaction is:

$$[A] 0 \quad [B] 1 \quad [C] 2 \quad [D] 3$$

Sol. Ans [C]

$$1 + 0 = 1$$

Ex. 18 The slowest step of a particular reaction is found to be



The order of the reaction is

$$[A] 2 \quad [B] 3 \quad [C] 3.5 \quad [D] 1.5$$

Sol. Ans [D]

$$r = k [X_2]^{\frac{1}{2}} [Y_2]^1 \quad \therefore \text{order} = 0.5 + 1 = 1.5$$

19. The rate of certain hypothetical reaction $A + B + C \rightarrow \text{Products}$, is given by

$$r = \frac{dA}{dt} = k[A]^{\frac{1}{2}} [B]^{\frac{1}{3}} [C]^{\frac{1}{4}}$$

The order of a reaction is given by

$$[A] 1 \quad [B] \frac{1}{2} \quad [C] 2 \quad [D] \frac{13}{12}$$

Sol. Ans [D]

$$\text{order of reaction} = \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$$

$$= \frac{6 + 4 + 3}{12}$$

$$= \frac{13}{12}$$