70, 71, 74

[52-55
  42-44

$P \rightleftharpoons 2Q$ (fast) $\longrightarrow \frac{k_1}{k_2} = \frac{[Q]^2}{[P]}$

$2Q + P \longrightarrow R$ (slow)

$$\frac{d[R]}{dt} = k_3[Q]^2[P]$$

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(74) $\text{Rate} = k[NO_2][O_3]$

$\text{Rate} = k[NO_2][O]$

$= \frac{k k_1}{k_{-1}} \times \frac{[NO_2][O_3]}{[O_2]}$

$\frac{k_1}{k_{-1}} = \frac{[O_2][O]}{[O_3]}$

$0.16 = \frac{3.3 \times 10^{-4}}{k_b}$

(52) $A + 2B + F \rightarrow A + 2E$

$t_{1/2} = \frac{\ln 2}{k_f + k_b}$

Molecularity :→

1st definition :→ It is equal to the sum of the stoichiometric coefficient of reactants in an elementary rxn

Elementary Rxn	Molecularity
$A \longrightarrow P_1$	1 (Uni)
$2A \longrightarrow P_2$	2 (bi)
$A + B \longrightarrow P_3$	2
$2A + B \longrightarrow P_4$	3 (tri or ter)

2nd definition :→

It is equal to the no. of molecules colliding simultaneously.

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1) Molecularity can not be zero, fraction or negative.

2) Molecularity greater than 3 is rare

3) for complex Rxn molecularity has no meaning.

$$2NO_2 + F_2 \rightarrow 2NO_2F$$

$$NO_2 + F_2 \rightarrow NO_2F + F$$

$$NO_2 + F \rightarrow NO_2F$$

$$A + \tfrac{1}{2}B \rightarrow C$$

Elementary

$$A + B \rightarrow P$$

$$2A + 2B \rightarrow 2P$$

Balanced

⑤ for elementary Rxn order = molecularity

In O.C Molecularity of complex Rxn = Molecularity of RDS

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Collision theory of Rxn :→

Acc to collision theory reactant molecules must collide with each other to form products

$$\text{Rate} = Z_{AB}$$

↑ Collision frequency (no. of collision betn A & B per second per unit volume)

the theoretical rate Calculated above was found to be much higher than the experimental rate therefore it was concluded that not all the collisions result in product formation To form product collision must be effective for that following two barrier must be overcome.

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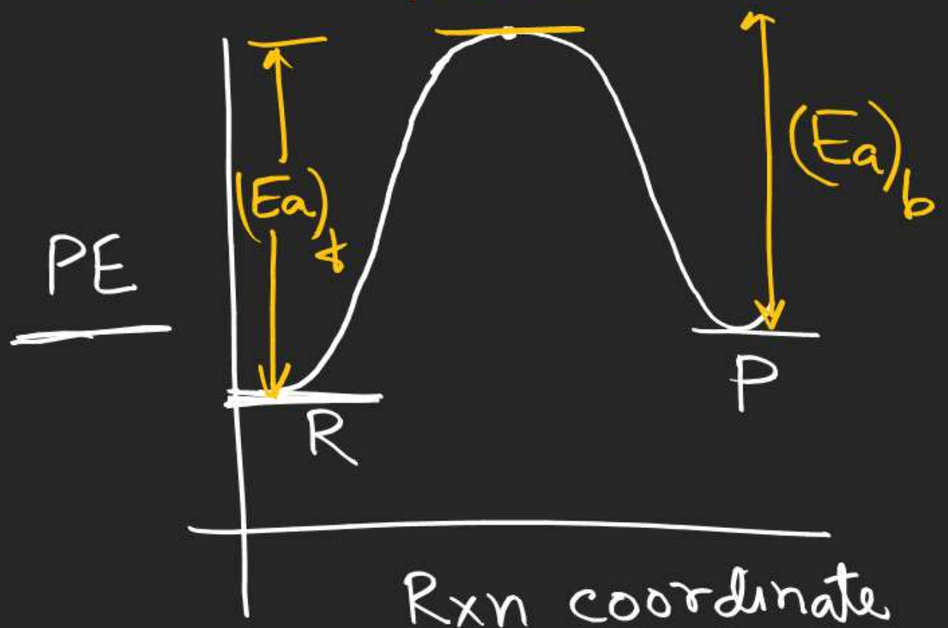
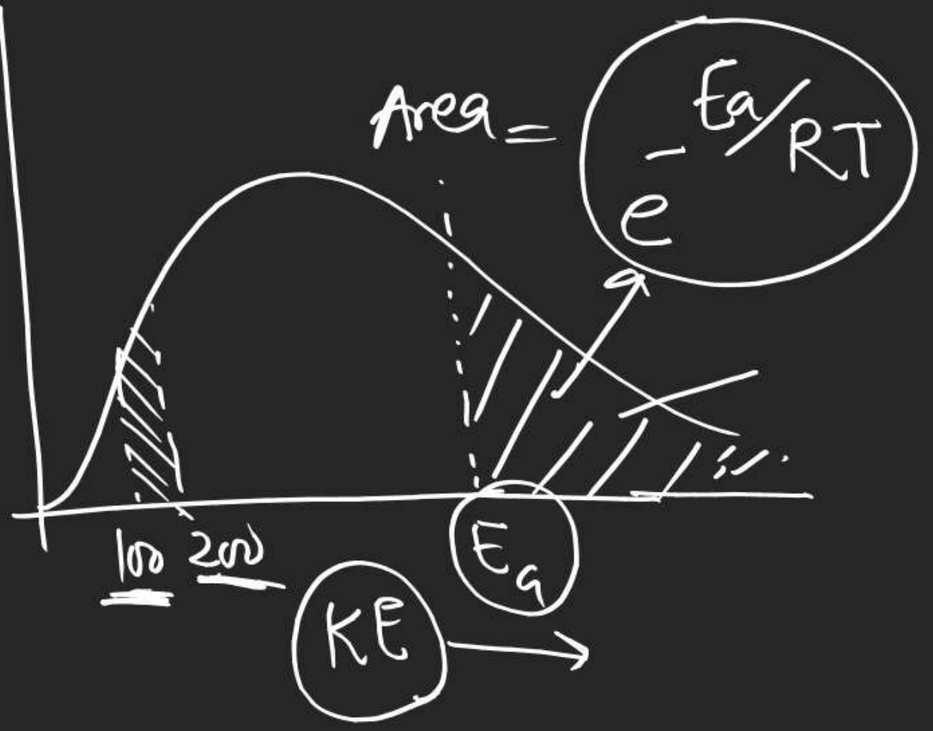
Energy barrier :→

Transition state / activated complex



Activation Energy :

Minimum Kinetic energy which must be possessed by reactants to form product



Area = $e^{-Ea/RT}$ = fraction of molecules having KE greater than E_a

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J- Main

J- Adv 2, 5, 6, 7
12, 13, 14