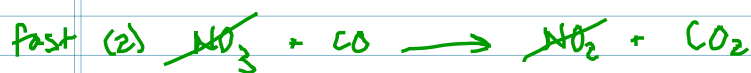
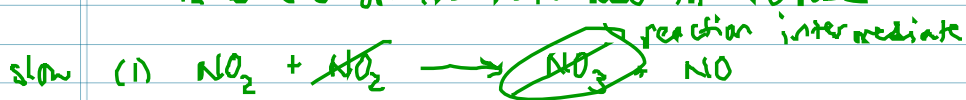


REACTION MECHANISM

- Many chemical reactions actually take place as a series of steps
- the overall reaction is the sum of the individual or "elementary" steps
- the slowest step in a reaction mechanism is called the rate determining step" RDS
- the rate law for the overall reaction is based on the rate law for the RDS



rate law for elementary step \Rightarrow coefficients become exponents

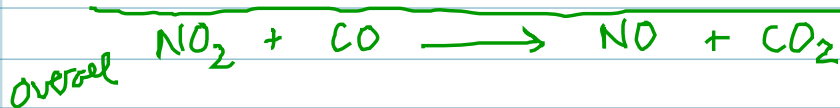
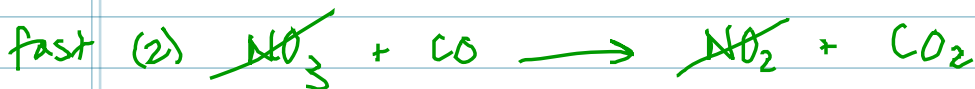
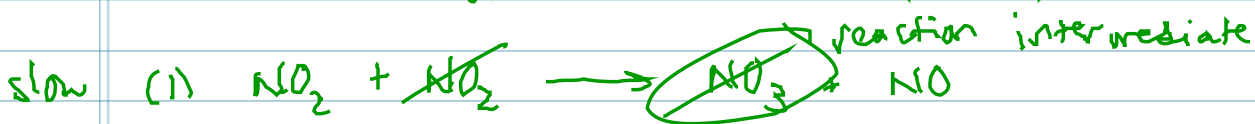
$$\text{rate} = k [\text{NO}_2]^2 \quad \text{RDS rate law}$$

overall rate law \Rightarrow must include all reactants from the overall reaction

$$\text{rate} = k [\text{NO}_2]^2 [\text{CO}]^0$$

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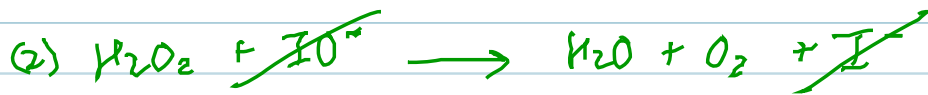
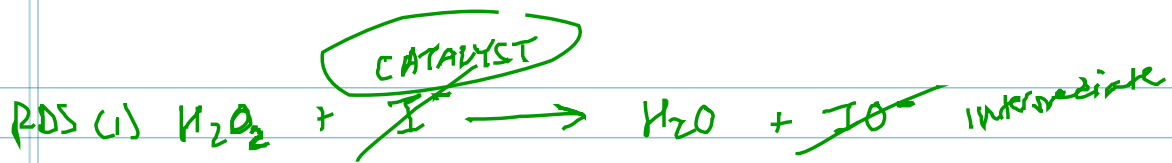


rate law
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slow step

rate law $\text{rate} = k [\text{H}_2\text{O}_2] [\text{I}^-]$

overall

rate law $\Rightarrow \text{rate} = k [\text{H}_2\text{O}_2] [\text{I}^-]$

rate law $\text{rate} = k [\text{N}_3^-]^1 [\text{CS}_2]^1 [\text{I}_3^-]^0$