**Chemical Kinetics:**

|  |  |
| --- | --- |
| **Instantaneous Rate of Appearance:** | **Average Rate of Appearance:**  **Average Rate of Disappearance:**  **Rate of a Chemical Reaction:** |
| **Method of Initial Rates:**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Trial | [A] | [B] | [C] | I. Rate | | 1 | 0.10 M | 0.10 M | 0.10 M | 0.20 M/s | | 2 | 0.20 M | 0.10 M | 0.10 M | 0.40 M/s | | 3 | 0.10 M | 0.20 M | 0.10 M | 0.80 M/s | | 4 | 0.10 M | 0.10 M | 0.20 M | 0.20 M/s |   **Rate Constant k:**  **Units of k:**  **Note:** | **Differential Rate Law Expression:**  **Finding The Order of a Reactant:**  **Overall order of the reaction:** |
| **Unimolecular:**  **Bimolecular:**  **Termolecular:** | **Factors Affecting the Rate of a Reaction:**   1. Temperature 2. Concentration 3. Catalyst 4. Surface Area 5. The Nature of the Reactants   **Reaction Mechanisms:**  **Note:** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reaction Order:** | **Zero Order:** | **1st Order:** | **2nd Order:** | **Nth Order:** |
| **Differential Rate Law Expression:** |  |  |  |  |
| **Units of k**: |  |  |  |  |
| **Half-Life:** |  |  |  |  |
| **Integrated Rate Law:** |  |  |  |  |
| **Slope:** |  |  |  |  |
| **Straight-line Plot:** |  |  |  |  |
| **Graph:** |  | IRL Formula Variation: |  | **Note:** |

|  |  |
| --- | --- |
|  | **Arrhenius Equation – Slope Intercept Form:**  **Slope (m) and Y-Intercept (b):** |
| **The Activation Energy**: **(J/mol)** | **Arrhenius Equation – Standard Form:** |
| **Temperature – Arrhenius Equation:** | **Arrhenius Equation – The Rate Constant k:** |
| **Notes:** | **The Rate Constant k:**  **Frequency Factor (A):** |
|  | **Rate Constant (k) and Activation Energy (Ea):**  **Rate Constant (k) vs Time (t):** |