**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):** |