N9 – Rate Laws

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| **Kinetics Summary Glue In -** *See Kinetics Reference Sheet for More Details* |
| **Differential Rate Law***Rate vs Concentration Data* | **Integrated Rate Law***Graph the following versus time. The one that is linear tells you the order! Why? Because of Math. Ha!* |
| **Order** | **Rate Law** | **Units on K** | **Memory Device** | **Y-axis** | **y = mx + b format** | **Straight Line Plot** | **k from Graph** | **Half Life Equation** |
| 0th | k | M/sec | **C***Concentration* | [A] | $$\left[A\right]\_{t}=-kt+ \left[A\right]\_{0}$$ | A graph of a slope  Description automatically generated | - slope | $$t\_{1/2}= \frac{[A]\_{0}}{2k}$$ |
| 1st | k [A] | 1/sec | **N***Natural Log* | Ln [A] | $$\left.Ln[A\right]\_{t}=-kt+ \left.Ln[A\right]\_{0}$$ | A graph of a slope  Description automatically generatedLn[A]Ln[A]0 | - slope | $$t\_{1/2}= \frac{0.693}{k}$$ |
| 2nd | k [A]2 | 1/M•sec | **R***Reciprocal* | 1/[A] |  | A graph of a slope  Description automatically generated | slope | $$t\_{1/2}= \frac{1}{k [A]\_{0}}$$ |

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