

Elementary Step	Molecularity	Rate Law
A → products	Unimolecular	Rate = k[A]
A + A → products (2A → products)	Bimolecular	Rate = k[A] <sup>2</sup>
A + B → products		Rate = k[A][B]
A + A + B → products (2A + B → products)	Termolecular	Rate = k[A] <sup>2</sup> [B]
A + B + C → products		Rate = k[A][B][C]

$$k = Ae^{\left(\frac{-E_a}{RT}\right)} \quad \ln\left(\frac{k_2}{k_1}\right) = \frac{-E_a}{R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln(k) = -\frac{E_a}{R} \left(\frac{1}{T}\right) + \ln(A)$$

- $-E_a/R$  is the slope when graphing  $\ln(k)$  vs.  $(1/T)$
- $\ln(A)$  is the y-intercept
- $E_a = -R(\text{slope})$
- Graphing  $\ln(k)$  vs  $(1/T)$  and taking line of best fit can quickly yield a slope

Elementary Step	Molecularity	Rate Law
A → products	Unimolecular	Rate = k[A]
A + A → products (2A → products)	Bimolecular	Rate = k[A] <sup>2</sup>
A + B → products		Rate = k[A][B]
A + A + B → products (2A + B → products)	Termolecular	Rate = k[A] <sup>2</sup> [B]
A + B + C → products		Rate = k[A][B][C]

$$k = Ae^{\left(\frac{-E_a}{RT}\right)} \quad \ln\left(\frac{k_2}{k_1}\right) = \frac{-E_a}{R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln(k) = -\frac{E_a}{R} \left(\frac{1}{T}\right) + \ln(A)$$

- $-E_a/R$  is the slope when graphing  $\ln(k)$  vs.  $(1/T)$
- $\ln(A)$  is the y-intercept
- $E_a = -R(\text{slope})$
- Graphing  $\ln(k)$  vs  $(1/T)$  and taking line of best fit can quickly yield a slope

Elementary Step	Molecularity	Rate Law
A → products	Unimolecular	Rate = k[A]
A + A → products (2A → products)	Bimolecular	Rate = k[A] <sup>2</sup>
A + B → products		Rate = k[A][B]
A + A + B → products (2A + B → products)	Termolecular	Rate = k[A] <sup>2</sup> [B]
A + B + C → products		Rate = k[A][B][C]

$$k = Ae^{\left(\frac{-E_a}{RT}\right)} \quad \ln\left(\frac{k_2}{k_1}\right) = \frac{-E_a}{R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln(k) = -\frac{E_a}{R} \left(\frac{1}{T}\right) + \ln(A)$$

- $-E_a/R$  is the slope when graphing  $\ln(k)$  vs.  $(1/T)$
- $\ln(A)$  is the y-intercept
- $E_a = -R(\text{slope})$
- Graphing  $\ln(k)$  vs  $(1/T)$  and taking line of best fit can quickly yield a slope

Elementary Step	Molecularity	Rate Law
A → products	Unimolecular	Rate = k[A]
A + A → products (2A → products)	Bimolecular	Rate = k[A] <sup>2</sup>
A + B → products		Rate = k[A][B]
A + A + B → products (2A + B → products)	Termolecular	Rate = k[A] <sup>2</sup> [B]
A + B + C → products		Rate = k[A][B][C]

$$k = Ae^{\left(\frac{-E_a}{RT}\right)} \quad \ln\left(\frac{k_2}{k_1}\right) = \frac{-E_a}{R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln(k) = -\frac{E_a}{R} \left(\frac{1}{T}\right) + \ln(A)$$

- $-E_a/R$  is the slope when graphing  $\ln(k)$  vs.  $(1/T)$
- $\ln(A)$  is the y-intercept
- $E_a = -R(\text{slope})$
- Graphing  $\ln(k)$  vs  $(1/T)$  and taking line of best fit can quickly yield a slope

Elementary Step	Molecularity	Rate Law
A → products	Unimolecular	Rate = k[A]
A + A → products (2A → products)	Bimolecular	Rate = k[A] <sup>2</sup>
A + B → products		Rate = k[A][B]
A + A + B → products (2A + B → products)	Termolecular	Rate = k[A] <sup>2</sup> [B]
A + B + C → products		Rate = k[A][B][C]

$$k = Ae^{\left(\frac{-E_a}{RT}\right)} \quad \ln\left(\frac{k_2}{k_1}\right) = \frac{-E_a}{R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln(k) = -\frac{E_a}{R} \left(\frac{1}{T}\right) + \ln(A)$$

- $-E_a/R$  is the slope when graphing  $\ln(k)$  vs.  $(1/T)$
- $\ln(A)$  is the y-intercept
- $E_a = -R(\text{slope})$
- Graphing  $\ln(k)$  vs  $(1/T)$  and taking line of best fit can quickly yield a slope

Elementary Step	Molecularity	Rate Law
A → products	Unimolecular	Rate = k[A]
A + A → products (2A → products)	Bimolecular	Rate = k[A] <sup>2</sup>
A + B → products		Rate = k[A][B]
A + A + B → products (2A + B → products)	Termolecular	Rate = k[A] <sup>2</sup> [B]
A + B + C → products		Rate = k[A][B][C]

$$k = Ae^{\left(\frac{-E_a}{RT}\right)} \quad \ln\left(\frac{k_2}{k_1}\right) = \frac{-E_a}{R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln(k) = -\frac{E_a}{R} \left(\frac{1}{T}\right) + \ln(A)$$

- $-E_a/R$  is the slope when graphing  $\ln(k)$  vs.  $(1/T)$
- $\ln(A)$  is the y-intercept
- $E_a = -R(\text{slope})$
- Graphing  $\ln(k)$  vs  $(1/T)$  and taking line of best fit can quickly yield a slope