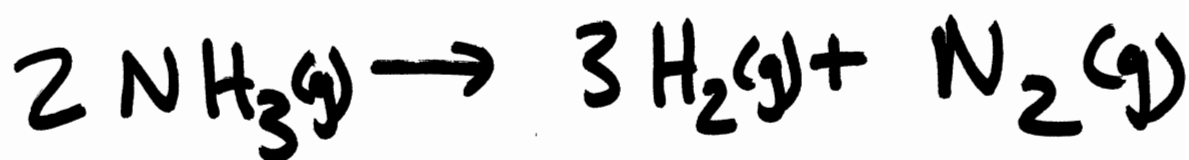
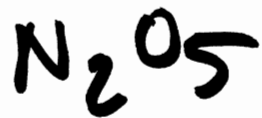


zero order



3rd order



14.51

a) $E_a = 45 \text{ kJ/mol}$, $\Delta E = -25 \text{ kJ/mol}$

b) $E_a = 35 \text{ kJ/mol}$, $\Delta E = -10 \text{ kJ/mol}$

c) $E_a = 55 \text{ kJ/mol}$, $\Delta E = 10 \text{ kJ/mol}$

b) is fastest because it has lowest activation energy

c) is slowest. ΔE only affects

overall energy (exo or endothermic)

not the rate

14.53

1st order rxn.

$$k = 2.75 \times 10^{-2} \text{ s}^{-1} @ 20^\circ\text{C} = 293 \text{ K}$$

What is $k @ 60^\circ\text{C} = 323 \text{ K}$

a) $E_a = 75.5 \text{ kJ/mol}$

b)

$$\ln\left(\frac{k_1}{k_2}\right) = \frac{E_a}{R} \left(\frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\ln \frac{2.75 \times 10^{-2}}{k_2} = \left(\frac{75.5 \text{ kJ/mol}}{8.314} \right) \left(\frac{1}{323} - \frac{1}{293} \right)$$

$$-\ln k_2 = -\ln 2.75 \times 10^{-2} + \dots$$

$$k_2 = e^{\dots}$$

~~e^{\dots}~~ + +