

Worksheet 5

1. The first-order rate constant for the decomposition of N_2O_5 at $70\text{ }^\circ\text{C}$ is $6.82 \times 10^{-3}\text{ s}^{-1}$.



Suppose we start with 0.0250 mol of $\text{N}_2\text{O}_5 (\text{g})$ in a volume of 2.0 L . a) How many moles of N_2O_5 will remain after 2.5 min ? b) How many minutes will it take for the quantity of N_2O_5 to drop to 0.010 mol ? c) What is the half-life of N_2O_5 at $70\text{ }^\circ\text{C}$?

2. $\text{Cl} (\text{g}) + \text{HBr} (\text{g}) \rightarrow \text{HCl} (\text{g}) + \text{Br} (\text{g})$

Has an overall enthalpy change of -66 kJ . The activation energy for the reaction is 7 kJ .

a) Sketch the energy profile for the reaction, and label E_a and ΔE . b) What is the activation energy for the reverse reaction?