

Kinetics Problems

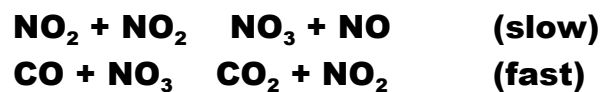
- ❖ A reaction has a rate constant of $4.58 \times 10^3 \text{ s}^{-1}$.
 - Calculate the half-life (λ) of the reaction.
 - How many seconds are required for the concentration of the reactant to decrease by 15.4%.

- ❖ A reaction ($A + 2B \rightarrow C$) has the following rate data:

$[A]_0/\text{M}$	$[B]_0/\text{M}$	$\text{Rate}_0/\text{M s}^{-1}$
0.1523	0.0115	1.45
0.3051	0.0115	3.00
0.3051	0.0232	5.99

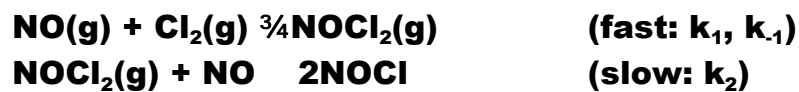
- ❖ Calculate the rate law for this reaction.
- ❖ Find the rate constant with the units.
- ❖ What is the rate of this reaction if $[A] = 0.1000 \text{ M}$ and $[B] = 0.0150 \text{ M}$?

- ❖ The reaction ($\text{CO} + \text{NO}_2 \rightarrow \text{CO}_2 + \text{NO}$) has the following proposed mechanism:



What is the predicted rate law for this reaction?

- ❖ The reaction ($2 \text{NO} + \text{Cl}_2 \rightarrow 2 \text{NOCl}_2$) has the following proposed mechanism:



Find the predicted mechanism for this reaction.

❖ **A reaction has a rate constant of $4.53 \times 10^{-2} \text{ M}^{-1} \text{ s}^{-1}$ at 22.5 C and $6.89 \times 10^{-2} \text{ M}^{-1} \text{ s}^{-1}$ at 28.9 C. What is the rate constant at 25.0 C?**