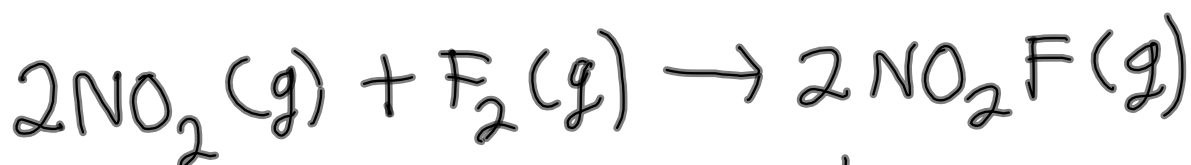


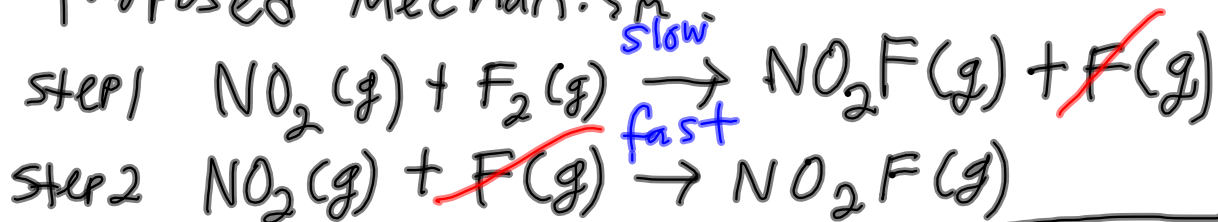
## REACTION MECHANISMS



Experimentally determined



Proposed mechanism:



predicted Rate Law:

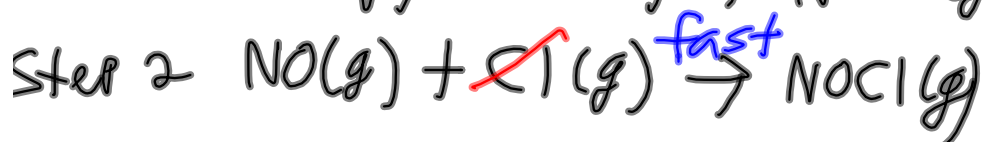
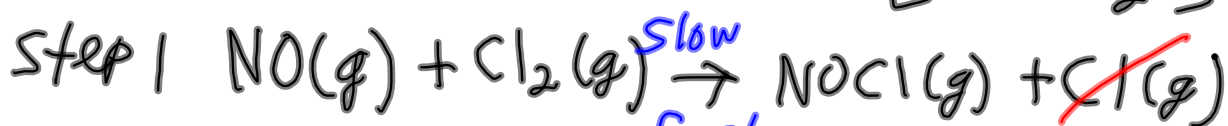


## REACTION MECHANISMS



Experimentally determined

Rate Law:  $R = k[\text{NO}]^2[\text{Cl}_2]$

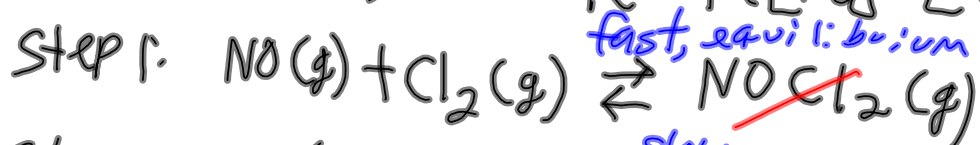


Predicted Rate Law:

$$R = k[\text{NO}][\text{Cl}_2]$$



EXP'1 Rate Law:  $R = k[\text{NO}]^2[\text{Cl}_2]$



predicted Rate Law:

$$R = k[\text{NO}][\text{NOCl}_2]$$

$$R_{1f} = k_{1f}[\text{NO}][\text{Cl}_2]$$

$$R_{1r} = k_{1r}[\text{NOCl}_2]$$

At equil:  $R_{1r} = R_{1f}$

$$k_{1r}[\text{NOCl}_2] = k_{1f}[\text{NO}][\text{Cl}_2]$$

solve

$$[\text{NOCl}_2] = \left(\frac{k_{1f}}{k_{1r}}\right)[\text{NO}][\text{Cl}_2]$$

$$R_{2f} = k_{2f}[\text{NO}][\text{NOCl}_2]$$

$$R_{2f} = k_{2f}[\text{NO}]\left(\frac{k_{1f}}{k_{1r}}\right)[\text{NO}][\text{Cl}_2]$$

$$= \left(\frac{k_{2f} \cdot k_{1f}}{k_{1r}}\right)[\text{NO}]^2[\text{Cl}_2]$$