Reaction Mechanism

$$2NO + O_2 \rightarrow 2NO_2$$

$$\text{rate} = k[NO]^2$$

step 1 $2NO \rightleftharpoons N_2O_2$

step 2 $N_2O_2 + O_2 \rightarrow 2NO_2$

overall reaction: $2NO + O_2 \rightarrow 2NO_2$

intermediates: N_2O_2

relative rates of *steps 1* and *2*