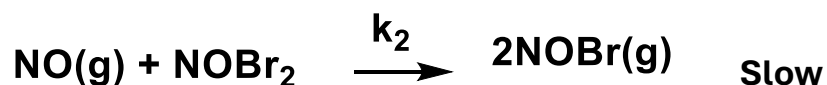
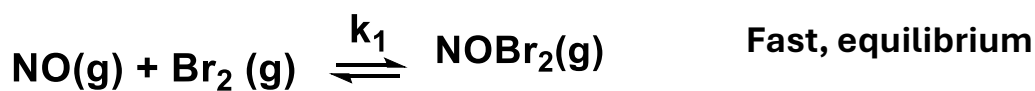


The rate law expression of hydrogen peroxide and iodide in an acidic solution is found to be first order for hydrogen peroxide and first order for iodide. Does the proposed mechanism below support this rate law expression?

Step 1	$\text{H}_2\text{O}_2(\text{aq}) + \text{I}^-(\text{aq}) \xrightarrow{k_1} \text{H}_2\text{O}(\text{aq}) + \text{OI}^-(\text{aq})$	Slow
Step 2	$\text{H}^+(\text{aq}) + \text{OI}^-(\text{aq}) \xrightarrow{k_2} \text{HOI}(\text{aq})$	Fast
Step 3	$\text{HOI}(\text{aq}) + \text{H}^+(\text{aq}) + \text{I}^-(\text{aq}) \xrightarrow{k_3} \text{I}_2(\text{aq}) + 2\text{H}_2\text{O}(\text{aq})$	Fast
overall	$\text{H}_2\text{O}_2(\text{aq}) + 2\text{I}^-(\text{aq}) + 2\text{H}^+(\text{aq}) \rightarrow \text{I}_2(\text{aq}) + 2\text{H}_2\text{O}(\text{aq})$	

1. Using the following reaction mechanism



Determine the overall balanced reaction and the rate law.