

## Rate Expressions Worksheet

- 1) Write the following for the reaction  $\text{N}_2 + 3 \text{H}_2 \rightarrow 2 \text{NH}_3$
- The rate expression for the reaction
  - The order of the reaction in each of the reagents
  - The overall order of the reaction
- 2) The rate constant for the reaction  $\text{HNO}_3 + \text{NH}_3 \rightarrow \text{NH}_4\text{NO}_3$  is  $14.5 \text{ L / mol}\cdot\text{sec}$ . If the concentration of nitric acid is  $0.050 \text{ M}$  and the concentration of ammonia is  $0.10 \text{ M}$ , what will the rate of this reaction be?
- 3) When two compounds, A and B, are mixed together, they form compound C, by a reaction that's not well understood. Fortunately, the following rate information was experimentally determined, as shown below:

<b>[A]</b> <b>(mol/L)</b>	<b>[B]</b> <b>(mol/L)</b>	<b>Rate</b> <b>(mol/L·sec)</b>
0.050	0.050	$4.0 \times 10^{-3}$
0.10	0.050	$8.0 \times 10^{-3}$
0.050	0.10	$1.6 \times 10^{-2}$

- a) Determine the rate expression for this reaction.
- b) Determine the rate constant for this reaction.