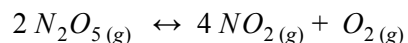


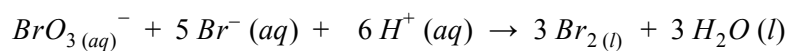
Ch 15: Chemical Kinetics — Differential Rate Law Worksheet

1. True or false: The units of rate constant are always M/s.
2. True or false: The rate constant (k) can be negative.
3. The decomposition of N_2O_5 proceeds according to the following reaction:



If the rate of decomposition of N_2O_5 at a particular instant in a reaction vessel is $4.2 \times 10^{-7} M/S$, what is the rate of appearance of NO_2 and O_2 ?

4. The reaction between bromate ions and bromide ions in aqueous solution is given by the following equation:



Experiment	$[BrO_3^-]$ (mol/L)	$[Br^-]$ (mol/L)	$[H^+]$ (mol/L)	Initial rate (mol/L · s)
1	0.100	0.100	0.100	8.0×10^{-4}
2	0.200	0.100	0.100	1.6×10^{-3}
3	0.200	0.200	0.100	3.2×10^{-3}
4	0.100	0.100	0.200	3.2×10^{-3}

- a. Using the data given, what is the rate law of the reaction?
- b. What is the overall order of the reaction?
- c. What is the value of the rate constant (k)? Note: provide the correct units.
- d. What is the rate of the reaction if the concentrations of the three reactants as they appear in the chemical equation are 1.0, 2.0, and 3.0M, respectively?

5. Using the following table, answer part a-c:



[A] (mol/L)	[B] (mol/L)	[C] (mol/L)	Initial reaction rate (mol/L · s)
1.25	1.15	2.25	3.35
2.50	1.15	2.25	6.68
2.50	1.15	5.33	6.71
2.50	4.60	5.33	13.43

a. What is the rate law of this reaction?

b. What is the rate constant for this reaction (including units)?

- c. What is the initial reaction rate of a mixture of 0.20M A, 3.0M B, and 2.50M C?
6. The rate constant (k) for any reaction is dependent on:
- i. Concentration of the reactants
 - ii. Activation energy
 - iii. Temperature
 - iv. Order of the reaction
- a. iii
 - b. iv
 - c. ii and iii
 - d. i, ii, and iii
 - e. All of the above