Advanced Chemistry   NAME: _____PER: _____
More Practice Rate Law (Points)

Instructions: Complete the following problems. SHOW ALL WORK in the empty space below the questions.
        Remembers the units. Round to the correct number of significant figures.

Concept Questions

1. For the rate law rate = $k[A]^2[B][C]$, which of the following statements is false?
   a) The reaction is second order in [A]
   b) The reaction is first order in [B]
   c) The reaction is second order in [C]
   d) The reaction is 4th order overall

2. What is the overall reaction order for the following rate law: rate = $k[B]^2[C]$
   a) 0
   b) 1
   c) 2
   d) 3
   e) 4

3. The reaction A + 2B → C is first order in both B and A. The overall order of the reaction is _____.
   a) First
   b) Second
   c) Third
   d) Zero
   e) Fourth

4. For rate = $k[A][B]$, if the [A] increased by a factor of 5 while the [B] is kept the same, the rate would _____.
   a) Stay the same
   b)   Double
   c) Triple
   d) Increase by a factor of five
   e) Increase by a factor of 25

5. A reaction was found to be second order in carbon monoxide concentration. The rate of the reaction _____ if the [CO] is tripled, with everything else kept the same.
   a) doubled
   b) remains unchanged
   c) increase by a factor of 4
   d) increase by a factor of 9
   e) reduced by a factor of 2

6. If the rate law for the reaction (2A + 3B → products) is first order in A and first order in B, then the rate law is rate = _____.
   a) $k[A]$
   b) $k[A]^2[B]^3$
   c) $k[B]^2$
   d) $k[A]^2[B]$
   e) $k[A][B]$

7. If the rate law for the reaction (2A + 3B → products) is zero order in A and second order in B, then the rate law is rate = _____.
   a) $k[A]$
   b) $k[A]^2[B]^3$
   c) $k[B]^2$
   d) $k[A]^2[B]$
   e) $k[A][B]$

8. The kinetics of a reaction was studied and it was determined that the reaction rate increased by a factor of 4 when the concentration of B was quadrupled. The reaction is _____ order in B.
   a) zero
   b) third
   c) one-half
   d) first
   e) second

9. The overall order of a reaction is 2. The units of the rate constant for the reaction is
   a) M/s
   b) Ms^{-1}
   c) s^{-1}
   d) $M^{-1}s^{-1}$
   e) $M^{-2}s^{-1}$

10. The overall order of a reaction is 0. The units of the rate constant for the reaction is
   a) Ms^{-1}
   b) $M^{-3}s^{-1}$
   c) s^{-1}
   d) $M^{-1}s^{-1}$
   e) $M^{-2}s^{-1}$

Problems

11. The following data in the table was obtained for the reaction: $2A + B \rightarrow A_2B$

Experiment Number	[A] (M)	[B] (M)	Initial Rate (M/s)
1	0.420	0.530	0.420
2	0.420	1.590	3.780
3	0.140	0.530	0.140

a) What is the rate law for the reaction?

b) What is the overall order of the reaction?

c) What is rate constant?

d) What is the rate of the reaction when [A] = 0.350 M and [B] = 1.110 M.

12. The following data in the table was obtained for the reaction: $A + B \rightarrow AB$

Experiment Number	[A] (M)	[B] (M)	Initial Rate (M/s)
1	0.190	0.480	0.350
2	0.380	0.480	0.350
3	0.190	0.240	0.087

a) What is the rate law for the reaction?

b) What is the overall order of the reaction?

c) What is rate constant?

d) What is the rate of the reaction when [A] =0.200 M and [B] = 0.320 M.