CHM 1046 Fall, 2010

Quiz 5

Name (print)_____

Show all your work for complete (and partial) credit. Use units where appropriate and report your answers to the correct number of significant figures.

$\ln([A]_t/[A]_0) = -kt$ $1/[A]_t = kt + 1/[A]_0$ $t_{½}=1/(k[A]_0)$ $t_{½}=.693/k$

1. The rate law is rate = $k[A]^2$.

   a) After one half-life, the concentration of A, compared to the concentration at the start of the half-life, will be: (choose one): ¼ / ½ / the same / twice / four times.

   b) After one half-life, the reaction rate, compared to the rate at the start of the half-life, will be: (choose one): ¼ / ½ / the same / twice / four times.

2. The rate law for the reaction $2A + B \leftrightarrow A_2B$ was found to be rate = k[B]. If it takes 15s for the concentration of B to drop from 1.20 to 0.30M, how long will it take for the concentration to drop from 0.30M to 0.15M?

3. For a second order reaction, it takes 2.3min for the concentration of the reactant to drop from 0.80M to 0.40M. Starting with a concentration of 0.80M, what will the concentration be in 2.0min?

4. A first-order reaction has a half-life of 75s. Starting with a concentration of 2.75M, what will the concentration be after 1.50min?

4 points extra credit: what information do I need to calculate the freezing point of 0.10m cyclohexane in naphthalene? Please use correct terminology so I can look those values up in a reference book. If the values are specific to a certain compound, be sure to indicate the compound. For example, if you need a molecular weight, indicate the compound.