Rate equation and order reaction

Profession

Top of Form 1. For the overall hypothetical reaction A + 5B ---> 4C the rate of appearance of C given by may also be expressed as: A. B. C. D. 2. For the reaction 4 NH3(g) + 5 O2(g) ---> 4 NO(g) + 6 H2O(g), the value of -[NH3]/t = 2. 6 x 10-3 M/s at a particular time. What is the value of -[O2]/t at the same instant? A. 1. 3 x 10-2 M/s B. 2. 08 x 10-3 M/s C. 2. 6 x 10-3 M/s D. 3. 25 x 10-3 M/s E. 520 M/s 3. What is the overall order for the following reaction between acetone and iodine? The experimental rate law is rate = k [CH3COCH3] [H3O+]) CH3COCH3(aq) + I2(aq) +H2O ---> CH3COCH2I(aq) + H3O+(aq) + I-(aq) A. 0 B. 1 C. 2 D. 3 E. 4 4. Nitric oxide (NO) reacts with hydrogen (H2) according to the equation: 2 NO(g) + 2 H2(g) ---> N2(g) + 2 H2O(g) The following initial rates of reaction have been measured for the given reactant concentrations. Expt. # | NO | H2 | Rate (M/hr)| 1 | 0. 010 | 0. 020 | 0. 020| 2 | 0. 015 | 0. 020 | 0. 030| 3 | 0. 010 | 0. 010 | 0. 005| Which of the following is the rate law (rate equation) for this reaction? A. rate = k[NO]2 [H2] B. rate = k[NO] [H2]2 C. rate = k[NO] [H2]4 D. ate = k[NO] [H2] E. rate = k[NO]1/2 [H2]1/4 5. A certain first order reaction A ---> B is 46 % complete in 68 min at 25°C. What is its rate constant? A. 9. 06 x 10-3 min-1 B. 1. 14 x 10-2 min-1 C. 31 min-1 D. -1. 14 x 10-2 min-1 E. 51 min-1 6. What is the value of the rate constant for a first order reaction for which the half-life is 26. 7 min? A. 18. 5 min-1 B. 38. 5 min-1 C. 9. 25 min-1

D. 19. 3 min-1 E. 0. 026 min-1 7. A reaction which is second order has a rate constant of 1. 0 x 10-3 L· mol-1 ° sec-1. If the initial concentration of the reactant is 0. 200 M, how long will it take for the concentration to become 0. 250 M? A. 4. 0 x 104 s B. 3. 5 x 104 min C. 3. 5 x 104 s D. 8000 s E. 3. 5 x 10-2 s 8. What is the half life of the previous second order reaction? A. 200 s

B. 5000 s C. 0. 005 s D. 2 x 10-4 s E. none of the above 9. For the chemical reaction A ---> C, a plot of ln[A] versus time is found to give a straight line with a negative slope. What is the order of the reaction? A. third B. second C. first D. zero E. such a plot cannot reveal the order of reaction 10. What is the slope of an Arrhenius plot for the following reaction? CH3CHO(g) ---> CH4(g) + CO(g) Temp (K); k (L·mol-1·s-1) 700; 0. 11 730; 0. 035 790; 0. 343 A. 7. 86 x 10-2 L mol-1 s-1/K B. 2. 89 x 10-3 K C. -2. 87 x 103 K D. 3. 23 x 10-4 K E. -2. 32 x 104 K 11. The rate constant of a first order reaction is 3. 68 x 10-2 s-1 at 150°C. What is the rate constant at 170°C if the activation energy for the reaction is 71 kJ/mol? A. 9. 16 x 10-2 s-1 B. 3. 68 x 10-2 s-1 C. 10. 92 s-1 D. -4. 04 x 10-2 s-1 E. 2. 46 x 101 s-1 12. A catalyst increases the rate of a reaction by A. increasing the enthalpy of the reaction B. lowering the activation energy C. raising the activation energy D. decreasing the enthalpy of the reaction 13.

For the following exothermic reaction, the rate law at 298 K is: Rate = k [H2] [I2] ---------- H2(g) + I2(g) --> 2 HI(g) Addition of a catalyst would effect the initial rate of the reaction by: A. increasing the rate of the forward reaction B. increasing the rate of both forward and reverse reactions C. increasing the rate of the reverse reaction D. causing no increase or decrease in the rate of reaction E. none of the above 14. If the rate of the reaction PCl5 ---> PCl3 + Cl2 is increased a factor of four by doubling the concentration of PCl5, the rate law: A. depends on the concentrations of PCl3 and Cl2

B. is first order withrespectto PCl5 C. is second order with respect to PCl5 D. is fourth order with respect to PCl5 15.. Consider the reaction of CH3Cl with hydroxide ion CH3Cl + OH- --> CH3OH + Cl- At some temperature the

following data are collected: Initial conc| rate after 1 min| [CH3Cl]| [OH-| | 0. 1 M| 0. 1 M| 1 x 10-4 mole/L| 0. 2 M| 0. 1 M| 2 x 10-4 mole/L| 0. 1 M| 0. 2 M| 2 x 10-4 mole/L| A. The reaction is first order with respect to methyl chloride B. The reaction is first order with respect to hydroxide ion C. The reaction is second order overall D. All of the above