

BIOCHEMISTRY STUDENTS MOCK EXAMS

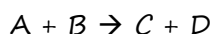
COURSE: BCH 211

TIME: 30 Mins

Instruction: Answer ALL questions carefully!

1. A substance weighing 3.28g suspected to contain carbohydrate was analyzed and found to contain 0.985g of sugar. The percentage and parts per billion of the sugar in the substance is A. 30%, 300ppb B. 30%, 3×10^8 ppb C. 30%, 3×10^5 ppb
2. ALL collision of reactants do not form product. TRUE/FALSE
3. If the temperature of a reaction is increased by 5°C , the reaction rate will A. Double B. Triple C. Remain constant
4. Increase in concentration of reactant does not affect the rate of reaction of A. Zero order B. First order C. Pseudo-first order
5. When equilibrium constant is greater than 1, A. equilibrium is at right, favoring product formation B. equilibrium is at left favoring reactant formation C. equilibrium is at left favoring reactant usage.
6. Graph of $\ln[A]$ against time (t) for a second order reaction will give a A. Linear graph B. non linear graph C. straight line graph
7. Of all factors affecting chemical reactions rate ___ is normally the most important and it is accounted for by ___ A. Concentration/Arrhenius equation B. Concentration/activation equation C. Temperature/Arrhenius equation D. Activation energy/Arrhenius equation
8. 1n moles is same as A. 10^{-9} μmoles B. 10^{-3} μmoles C. 10^{-12} moles
9. The pOH of 0.000015M H_2SO_4 is A. 8.7 B. 8.27 C. 9.27 D. 9.70

Use the information below to answer 11-14. Assume a reaction between elements A and B to give products of C and D.



Run	[A] (M)	[B] (M)	Initial rate (M/min)
1	0.010	0.020	0.012
2	0.020	0.030	0.144
3	0.010	0.010	0.006

10. What is the reaction order of [A] A. 3 B. 2 C. 1 D. 0
11. Determine the reaction order of [B] A. 1 B. 2 C. 3 D. 0
12. The overall order of reaction is A. 5 B. 4 C. 6 D. 3
13. The rate constant for the reaction is A. $6 \times 10^5 \text{ M}^{-2}/\text{min}$ B. $6 \times 10^5 \text{ M}^{-3}/\text{min}$ C. $6 \times 10^{-5} \text{ M}^{-3}/\text{min}$ D. $6 \times 10^4 \text{ M}^{-3}/\text{min}$

14. A weak acid will not A. dissociate completely in a base B. dissociate completely in water C. dissolve in a base D. dissociate partially in water
15. Ammonia reacts with water to form ammonium ion and hydroxyl ion as the ___ and ___ respectively A. conjugated acid, conjugated base B. conjugated base, conjugated acid C. conjugated base, acid D. base, conjugated acid
16. What is the pH of 0.026M of HNO_3 A. 1.59M B. 15×10^{-1} M C. 1.58×10^1 D. 1.59×10^0
17. Find the pH of a solution containing 80cm^3 of 0.2mol/dm^3 HCl mixed with 20cm^3 of 0.2M NaOH. The resulting solution contains the equivalent of 60cm^3 of 0.2mol/dm^3 of HCl in 100cm^3 of solution. A. 0.92 B. 0.16 C. 0.70 D. 0.69
18. Which of these is incorrect; buffers resist changes in pH on A. Addition of strong acids B. Addition of strong base C. Dilution D. None of the above
19. Which is incorrect; factors that affects the rate of chemical reactions are A. Concentrations of reactants B. Light C. Pressure D. Pressure (gaseous reaction)
20. Calculate the pKa of ethanoic acid if its K_a is $1.85 \times 10^{-5} \text{ mol/dm}^3$ A. 1.85×10^{-5} M B. 4.73M C. 1.85 D. 4.73
21. Which of these is not a definition of concentration A. measure of quantity of solvent that dissolves a solute B. measure of solute in solution C. measure of relative strength of solution
22. Calculate the molality of a concentrated stock solution of HCl with the following information: 0.4M, 28%w/w A. 38.89g/1000g water B. 388.9g/1000g water C. 3.889g/1000g water
23. Summation of the total mole fraction equals A. 0 B. 1 C. Calculated value
24. $N=nM$, what does N and n means? A. number of moles and normality B. Molality and number of moles C. Normality and numbers of mole
25. Concentration of commercial acids are given mostly in A. % by weight B. %w/v C. %w/w
26. Which of these shows the gram of solute in 100g of solution A. %w/v B. %w/w C. % by weight
27. If to 1cm^3 of 5M HCl solution in a test tube is added 9cm^3 of distilled water, this is the first dilution. If 9cm^3 of water is added to 1cm^3 of the solution in the first dilution in another test tube, this makes the second dilution. If this is repeated till the 10^{th} dilution, what is the concentration of the solution in the 10^{th} test tube? A. 0.000000005M B. 0.000000005M C. 0.0000000005M
28. The unit for the rate constant of a second order reaction is A. M/s B. 1/s C. M^{-1}/s D. M^{-3}/s
29. The concentration of a first order reaction depends on time. TRUE/FALSE
30. If the half life of a reactant is 180seconds, what percentage of the initial concentration remains after 0.25hours? A. 2.15% B. 3.12% C. 4.5%
31. For a second order reaction, the rate constant depends on the concentration of reactants. TRUE/FALSE
32. $2\text{NOBr}(g) \rightarrow 2\text{NO}(g) + \text{Br}_2(g)$ is a second order reaction with respect to NOBr. If $k=0.204\text{M}^{-1}\text{s}^{-1}$ at 15°C . Determine the half life of the reaction if $[\text{NOBr}]_0=4.5 \times 10^{-3}\text{M}$. A. 1.089×10^2 B. 1.089×10^4 C. 1.089×10^3

33. The activation energy of a first order reaction is 5.02KJ/mol at 2.5°C. At what temperature will the reaction rate be doubled? ($R=8.314 \text{ Jmol}^{-1}\text{K}^{-1}$) A. 308K B. 30.8K C. 402K D. 40.2K
34. The choice of buffers does not depend on the pKa of acid. TRUE/FALSE
35. How many grams of NaOH will be dissolved in distilled water to have 500mL solution of 0.04M NaOH? A. 0.9g B. 0.8g C. 0.10g D. 0.85g
36. Weak acids have their dissociation constants A. less than 1 B. greater than 1 C. equals to 1
37. What mass of NaOH will be needed to make a 2.5M NaOH solution? A. 50g B. 100g C. 150g D. 5g
- I. High temperature shifts equilibrium position to the right
 - II. Decrease in temperature shifts equilibrium position to the right
 - III. Decrease in temperature shifts equilibrium position to the left
38. Which of the above statements is true for exothermic reactions? A. I, II B. II C. I, II, III D. I, III
39. Which of the statement is true for endothermic reactions? A. I, II B. II C. I, II, III D. I, III
40. The second law of thermodynamics is all about A. enthalpy B. entropy C. temperature changes
- $$\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$$
41. For the above reaction, the oxidizing agents are A. 3CO & Fe_2O_3 B. 3CO_2 & Fe_2O_3 C. 3CO & 2Fe D. 3CO_2 & 2Fe
42. For the reaction, the reducing agents are A. 3CO & Fe_2O_3 B. 3CO_2 & Fe_2O_3 C. 3CO & 2Fe D. 3CO_2 & 2Fe
43. For an electrochemical cell A. electrons flow from the anode to the cathode B. current flows from anode to cathode C. electrons and currents flow from the cathode to anode
44. For an electrochemical cell A. oxidation and reduction occurs at the negative terminal B. oxidation occurs at the negative terminal C. reduction occurs at the negative anode
- I. Loss of electron
 - II. Gain of electrons
 - III. Loss of Hydrogen
 - IV. Addition of hydrogen
 - V. Addition of Oxygen
45. Which of the statements define oxidation? A. I, II, IV B. II, III, V C. I, III, V D. I, V
46. Which of the statements define reduction? A. II, IV B. II, III, V C. I, III, V D. I, V
47. What is the pKa of an acid which its $K_a = 0.70 \times 10^{-9}$. A. 8.85 B. 7.98 C. 8.25 D. 8.45
48. Whose definition of a base was limited to ammonia's basic properties? A. Brønsted & Lowry B. Arrhenius C. Lewis
49. A supersaturated solution is a concentrated solution. TRUE/FALSE
50. The activities of buffers is maximum when the pH of the solution is equal to A. 1 B. pKa C. K_a D. K