

Practice Final Exam Chem 112

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Three hundred milliliters (150 mL) of 4.50 M sugar solution is diluted to 600 mL by the addition of pure water. Which of these statements about the solution is correct?
a. The moles of water remain the same. b. The moles of sugar decrease. c. The concentration of sugar increases to 5.0 M. d. The moles of sugar remain constant. e. All of these statements are incorrect.
- _____ 2. How many moles of solute are present in 75.0 grams of solution that is 1.30% by mass glucose ($C_6H_{12}O_6$)? $MM(C_6H_{12}O_6) = 180.16 \text{ g/mol}$
a. 5.4×10^{-3} moles b. 0.800 moles c. 176 moles d. 1.76×10^{-3} moles e. 225 moles
- _____ 3. A concentrated reagent is sold as a solution that is 60.0 mass % solute. If the molar mass of the solute is 244 g/mol and the density of this solution is 1.20 g/mL, what is the molarity of the solution?
a. 10.0 M b. 2.95 M c. 15.5 M d. 0.72 M e. 1.45 M
- _____ 4. The boiling point of pure benzene (C_6H_6) is 80.10 °C. A solution of 14.2 g of a solid dissolved in 64.0 g of benzene boils at 81.09 °C. If k_b for benzene is 2.53 °C/molal, the molar mass of the solid is:
a. 662 g/mol b. 56.0 g/mol c. 92.0 g/mol d. 628 g/mol e. 568 g/mol
- _____ 5. What is the freezing point for a 0.71 m solution of glycerol ($C_3H_8O_3$) in ethanol? Freezing point(ethanol) = -114.6 °C; $K_f(\text{ethanol}) = 1.99 \text{ °C/m}$
a. 0.10 °C b. -113.2 °C c. -1.41 °C d. -116.0 °C e. none of these
- _____ 6. At 450 °C, $K_c = 0.231$ for the reaction:



What is the value of the equilibrium constant for the following reaction at 450 °C?



- a. 0.481 b. 0.156 c. 0.231 d. 0.053 e. 4.329

- _____ 7. Consider the following system at equilibrium and its corresponding concentration equilibrium constant:



What is the value of K_p for this reaction at 470 °C?

- a. $K_p = 3.80 \times 10^6$ b. $K_p = 8.53 \times 10^6$ c. $K_p = 4.32 \times 10^5$ d. $K_p = 1.10 \times 10^6$ e. $K_p = 1.19 \times 10^6$

- _____ 8. For the reaction $\text{I}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons 2 \text{ICl}(\text{g})$, the relation between K_p and K_c is:
a. $K_p = K_c$ b. $K_p = K_c(RT)^2$ c. $K_p = K_c(RT)^{-2}$ d. $K_c = K_p(RT)^2$ e. $K_p = K_c(RT)^4$

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