AP MULTIPLE CHOICE QUESTIONS
CH. 13, SET 3

1999

33. A 1.0 L sample of an aqueous solution contains 0.10 mol of NaCl and 0.10 mol of $CaCl_2$. What is the minimum number of moles of $AgNO_3$ must be added to the solution in order to precipitate all of the Cl^- as AgCl (s)? (Assume that AgCl is insoluble)

(A)   0.10 mol
(B)   0.20 mol
(C)   0.30 mol
(D)   0.40 mol
(E)   0.60 mol

42.

Mass of an empty container	= 3.0 grams
Mass of container + solid sample	= 25.0 grams
Volume of the solid sample	= 11.0 cm^3

The data above were gathered in order to determine the density of an unknown solid. The density of the sample should be reported as

(A)   0.5 g/cm^3
(B)   0.50 g/cm^3
(C)   2.0 g/cm^3
(D)   2.00 g/cm^3
(E)   2.27 g/cm^3

52. Under which of the following sets of conditions could the most O_2 (g) be dissolved in H_2O (l)?

	Pressure of O_2 (g) above H_2O (l) (atm)	Temperature of H_2O (l) (^{o}C)
(A)	5.0	80
(B)	5.0	20
(C)	1.0	80
(D)	1.0	20
(E)	0.5	20

53. If 87 g of K_2SO_4 (molar mass 174 g) is dissolved in enough water to make 250 mL of solution, what are the concentrations of the potassium and the sulfate ions?

	$[K^+]$	$[SO_4^{2-}]$
(A)	0.020 M	0.020M
(B)	1.0 M	2.0 M
(C)	2.0 M	1.0 M
(D)	2.0 M	2.0 M
(E)	4.0 M	2.0 M

70. When 100 mL of 1.0 M Na_3PO_4 is mixed with 100 mL of 1.0 M $AgNO_3$, a yellow precipitate forms and the silver concentration becomes negligibly small. Which of the following is a correct listing of the ions remaining in solution in order of <u>increasing</u> concentration?

(A) $[PO_4^{3-}] < [NO_3^-] < [Na^+]$
(B) $[PO_4^{3-}] < [Na^+] < [NO_3^-]$
(C) $[NO_3^-] < [PO_4^{3-}] < [Na^+]$
(D) $[Na^+] < [NO_3^-] < [PO_4^{3-}]$
(E) $[Na^+] < [PO_4^{3-}] < [NO^{3-}]$

57. Molecules that have planar configurations include which of the following?

I. BCl_2
II. $CHCl_3$
III. NCl_3

(A)   I only
(B)   III only
(C)   I and II only
(D)   II and III only
(E)   I, II, and III

75. Which of the following pairs of liquids forms the solution that is most ideal (most closely follows Raoult's Law)?

(A) C_8H_{18} (l) and H_2O (l)
(B) $CH_3CH_2CH_2OH$ (l) and H_2O (l)
(C) $CH_3CH_2CH_2OH$ (l) and C_8H_{18} (l)
(D) C_6H_{14} (l) and C_8H_{18} (l)
(E) H_2SO_4 (l) and H_2O (l)

1994

33. A hydrocarbon gas with an empirical formula CH_2 has a density of 1.88 grams per liter at 0^oC and 1.00 atm. A possible formula for the hydrocarbon is

(A) CH_2 (B) C_2H_4 (C) C_3H_6 (D) C_4H_8 (E) C_5H_{10}