AP Chemistry
Oceana H.S.

Name_____

AP MULTIPLE CHOICE QUESTIONS
CH. 16, SET 4

1994

66. What is the pH of 1.0×10^{-2}-molar solution of HCN? (For HCN, $K_a = 4.0 \times 10^{-10}$)

(A) 10
(B) between 7 & 10
(C) 7
(D) between 4 & 7
(E) 4

74. A solution of calcium hypochlorite, a common additive of swimming pool water, is

(A) basic because of the hydrolysis of the OCl^- ion.
(B) basic because $Ca(OH)_2$ is a weak and insoluble base.
(C) neutral if the concentration is kept below 0.1 molar.
(D) acidic because of the hydrolysis of the Ca^{2+} ions.
(E) acidic because the acid HOCl is formed.

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38. A molecule or an ion is classified as a Lewis acid if it

(A) accepts a proton from water.
(B) accepts a pair of electrons to form a bond.
(C) donates a pair of electrons to form a bond.
(D) donates a proton to water.
(E) has resonance Lewis electron-dot structures.

45. What is the H^+ (aq) concentration in 0.05 M HCN (aq)? (The K_a for HCN is 5.0×10^{-10})

(A) 2.5×10^{-11} M
(B) 2.5×10^{-10} M
(C) 5.0×10^{-10} M
(D) 5.0×10^{-6} M
(E) 5.0×10^{-4} M

59. A 40.0 mL sample of 0.25 M KOH is added to 60.0 mL of 0.15 M $Ba(OH)_2$. What is the molar concentration of OH^- (aq) in the resulting solution? (Assume that the volumes are additive)

(A) 0.10 M
(B) 0.19 M
(C) 0.28 M
(D) 0.40 M
(E) 0.55 M

65. Which of the following compounds is NOT appreciably soluble in water but is soluble in dilute hydrochloric acid?

(A) $Mg(OH)_2$ (s)
(B) $(NH_4)CO_3$ (s)
(C) $CuSO_4$ (s)
(D) $(NH_4)_2SO_4$ (s)
(E) $Sr(NO_3)_2$ (s)

AP Test I
Questions 10 - 11

(A) 1.0 M
(B) 5.0×10^{-1} M
(C) 1.0×10^{-1} M
(D) 5.0×10^{-2} M
(E) 1.0×10^{-3} M

What is the molarity of a solution of NaOH if:

10. The pH is 11.00.

11. The concentration of H_3O^+ ions is 2×10^{-14}M.

27. What is the pH of a 1.0 M solution of formic acid if the K_a is 1.77×10^{-4}?

(A) $\log (1.77 \times 10^{-4})/[H^+]$
(B) $\log [A^-]$
(C) $\log (1.77 \times 10^{-4})$
(D) $\log (1.77 \times 10^{-4})^{1/2}$
(E) 0

62. The electron-dot structure (Lewis structure) for which of the following molecules would have two unshared pairs of electrons on the central atom?

(A) H_2S
(B) NH_3
(C) CH_4
(D) HCN
(E) CO_2

62. $HC_2H_3O_2$ (aq) + CN^- (aq) ⇌ HCN (aq) + $C_2H_3O_2^-$ (aq)

The reaction represented above has an equilibrium constant equal to 3.7×10^4. Which of the following can be concluded from this information?

(A) CN^- (aq) is a stronger base than $C_2H_3O_2^-$ (aq).
(B) HCN (aq) is a stronger acid than $HC_2H_3O_2$ (aq).
(C) The conjugate base of CN^- (aq) is $C_2H_3O_2^-$ (aq).
(D) The equilibrium constant will increase with an increase in temperature.
(E) The pH of a solution containing equimolar amounts of CN^- (aq) and $HC_2H_3O_2$ (aq) is 7.0.