South Pasadena • AP Chemistry

Name _____
Period ___ Date ___/___/___

17 • Acid-Base Equilibria

PRACTICE TEST

1. What is the $[H^+]$ when $[OH^-] = 8.1 \times 10^{-5}$?
   a) 8.1×10^{-5} M
   b) 1.0×10^{-7} M
   c) 1.2×10^{-10} M
   d) 3.6×10^{-6} M
   e) 8.1×10^{-5} M

2. What is the $[H^+]$ when $[OH^-] = 3.3 \times 10^{-9}$?
   a) 3.0×10^{-6} M
   b) 1.0×10^{-7} M
   c) 3.3×10^{-5} M
   d) 6.6×10^{-5} M
   e) 3.3×10^{-9} M

3. What is the $[H^+]$ in a 0.0025 M HCl solution?
   a) 1.0×10^{-7} M
   b) 4.0×10^{-12} M
   c) 2.5×10^{-3} M
   d) 3.6×10^{-5} M
   e) need more info

4. What is the $[OH^-]$ in a 0.0050 M HCl solution?
   a) 5.0×10^{-3} M
   b) 1.0 M
   c) 1.0×10^{-7} M
   d) 6.6×10^{-5} M
   e) 2.0×10^{-12} M

5. A solution in which $[H^+] = 10^{-8}$ has a pH of ___ and is _____.
   a) 8, acidic
   b) 6, basic
   c) -6, basic
   d) -8, neutral
   e) 8, basic

6. What is the pH of a 0.00030 M HNO_3 solution?
   a) 8.11
   b) 3.00
   c) 3.52
   d) 4.48
   e) none of these

7. What is the pH of a 0.0060 M KOH solution?
   a) 5.12
   b) 2.22
   c) 11.78
   d) 8.88
   e) 7.00

8. A sample of lemon juice is found to have a pH of 2.55. What is the H^+ concentration of the juice?
   a) 0.0035 M
   b) 0.0028 M
   c) 11.6 M
   d) 0.0080 M
   e) 355 M

9. A sample of milk is found to have a pH of 6.60. What is the OH^- concentration of the milk?
   a) 2.5×10^{-21} M
   b) 1.0×10^{-7} M
   c) 5.0×10^{-7} M
   d) 4.0×10^{-8} M
   e) 2.5×10^{-7} M

10. What is the concentration of OCl^- in a 0.60 M solution of HOCl? $K_a = 3.1 \times 10^{-8}$.
    a) 1.8×10^{-4} M
    b) 7.1×10^{-11} M
    c) 0.40 M
    d) 1.4×10^{-4} M
    e) 1.1×10^{-4} M

11. What is the pH of a 0.020 M solution of hydrosulfuric acid, a diprotic acid?
    $K_{a1} = 1.1 \times 10^{-7}$ $K_{a2} = 1.0 \times 10^{-14}$
    a) 7.00
    b) 9.67
    c) 7.84
    d) 4.33
    e) 3.05

12. What is the concentration of CO_3^{2-} in a 0.010 M solution of carbonic acid? The relevant equilbria are,

$H_2CO_3 \rightleftharpoons H^+ + HCO_3^-$ $K_{a1} = 4.3 \times 10^{-7}$

$HCO_3^- \rightleftharpoons H^+ + CO_3^{2-}$ $K_{a2} = 5.6 \times 10^{-11}$

a) 6.6×10^{-5} M
b) 5.6×10^{-11} M
c) 6.7×10^{-11} M
d) 7.5×10^{-7} M
e) 7.9×10^{-7} M

13. What is the S^{2-} concentration in a saturated solution (0.10 M) of H_2S, in which the pH has been adjusted to 6.00 by the addition of HCl? For H_2S, $K_{a1} = 1.1 \times 10^{-7}$ and $K_{a2} = 1.0 \times 10^{-14}$.

a) 1.1×10^{-16} M
b) 1.1×10^{-10} M
c) 1.0×10^{-2} M
d) 3.2×10^{-8} M
e) 3.2×10^{-6} M

14. Which of the following salts will result in a basic solution when it is dissolved in water?

a) KCl
b) NH_4I
c) NaCN
d) $MgBr_2$
e) none of these

15. What is the pH of a 0.50 M solution of $NaNO_2$? For HNO_2, $K_a = 4.5 \times 10^{-4}$.

a) 12.18
b) 5.48
c) 1.82
d) 8.52
e) 7.00

16. What is the pH of a 1.0 M solution of NaOCl? For HOCl, $K_a = 3.1 \times 10^{-8}$.

a) 10.75
b) 3.25
c) 3.75
d) 10.25
e) 7.00