$K_w = [H^+] \times [OH^-] = 1 \times 10^{-14}\ M$

$pH + pOH = 14$

$pH = -\log [H^+]$

Key

Chemistry
Chapter 19 Acids and Bases Practice Problems

Name:_____ Date:_____

1) What is the pH of a solution with $[H^+] = 1 \times 10^{-3}$M? $-\log [1\times10^{-3}] = 3$

2) What is the pOH of a solution if the $[OH^-] = 3.5 \times 10^{-2}$M? $-\log [3.5\times10^{-2}] = 1.5$

3) What is the pOH of a solution that has a pH of 3.4? $14.0 - 3.4 = 10.6$

4) A solution has a pOH of 12.4. What is the pH of this solution? $14.0 - 12.4 = 1.6$

5) Measurements of the pH of blood and urine are commonly used in diagnosing disease. The pH of the blood plasma of severely diabetic people, for example, is often lower than the normal value of 7.4; this condition is called acidosis. What is the $[H^+]$ in the blood plasma of a non-diabetic person with a pH of 7.4? $7.4 = -\log [H^+]$, $[H^+] = 10^{(-7.4)}$ $[H^+] = 4.0 \times 10^{-8}$M

6) Gastric juice in our stomach has a hydrogen ion concentration of 3.16×10^{-2}M. What is the pH of Gastric juice? Is this strongly acidic or basic? $-\log [3.16\times10^{-2}] = 1.5$

7) Household ammonia has a pH of 12. What is the hydrogen ion concentration of ammonia? $[H^+] = 10^{(-12)} = 1 \times 10^{-12}$ M

8) Classify each solution as acidic, basic, or neutral?
   a) $[H^+] = 2.5 \times 10^{-9}$M Basic pH = 8.6
   b) pOH = 12.0 ~~Basic~~ $14 - 12 = 2 \Rightarrow$ Acidic
   c) $[OH^-] = 9.8 \times 10^{-11}$M Acidic pOH = 10, pH = 4
   d) $[H^+] = 1 \times 10^{-7}$M neutral pH = 7
   e) pH = 0.8 Acidic

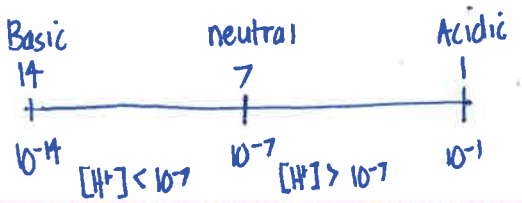
9) Calculate the pH of each solution.
   a) $[H^+] = 1 \times 10^{-5}$M $-\log [1\times10^{-5}] = 5$
   b) $[H^+] = 4.4 \times 10^{-11}$M $-\log [4.4\times10^{-11}] = 10.4$
   c) $[OH^-] = 2.2 \times 10^{-7}$M $-\log [2.2\times10^{-7}] = 6.7 = pOH$ $pH \rightarrow 14.0 - 6.7 = 7.3$
   d) pOH = 1.4 $14 - 1.4 = 12.6$

10) Lysosomal enzymes that function in digestion within our bodies perform best in an acidic environment with a hydrogen concentration of 1×10^{-5}M. What pH is the best for these enzymes to function?

$pH = -\log [1\times10^{-5}] = 5$

Board Q
If ~~a solution~~ the concentration of OH^- is 2.1×10^{-6}M, what is $[H^+]$? Is it Acidic, Basic, neutral

larger neg = smaller #



All based on pH

* older version *