10/10 ANS KEY

Name: [redacted]

Quiz : Calculating pH, pOH, $[H_3O^+]$ and $[OH^-]$

When a question requires calculations show all your work.

1. What is the pOH of a solution whose $[H_3O^+]$ is 2.75×10^{-4} M?

A. 3.636×10^{-11}

B. 3.64

(C.) 10.44

D. 3.56

$pH = -\log [H_3O^+]$

$pH = -\log [2.75 \times 10^{-4} M]$

$pH = 3.56$

$pH + pOH = 14$

$3.56 + pOH = 14$

$pOH = 10.44$

2. What is the $[OH^-]$ of a solution whose pH = 5.43 ?

A. 8.57

B. 269153

C. 3.72×10^{-6} M

(D.) 2.69×10^{-9} M

$pH + pOH = 14$

$5.43 + pOH = 14$

$pOH = 8.57$

$[OH^-] = 10^{-pOH}$

$[OH^-] = 10^{-8.57}$

$[OH^-] = 2.69 \times 10^{-9} M$

3. The pH of a 0.01-M solution of HCl is:
acid

A. 12

(B.) 2

C. -12

D. -2

$pH = -\log [H_3O^+]$

$pH = -\log [0.01 M]$

$pH = 2$

4. In aqueous solutions, $[H^+][OH^-]$ is equal to:

(A.) 1×10^{-14} M

B. 1×10^{14} M

C. 1×10^{-7} M

D. 7 M

5. What is the pH of a solution whose pOH is 11.09?

A. 15.09

(B.) 2.91

C. 25.09

D. -11.09

$pH + pOH = 14$
$pH + 11.09 = 14$
$pH = 2.91$

6. The normal pH of human blood is 7.4. Human blood is:

A. slightly acidic

B. strongly acidic

C. strongly basic

(D.) slightly basic

7. The pH of a softdrink is determined to be 4.0. What is the $[OH^-]$ of the drink?

A. 4 M

(B.) 1.0×10^{-10} M

C. 10 M

D. 1.0×10^{-4} M

$pH + pOH = 14$
$4.0 + pOH = 14$
$pOH = 10$
$[OH^-] = 10^{-pOH}$
$[OH^-] = 10^{-10}$
$[OH^-] = 1 \times 10^{-10}$ M

8. What is the pOH of a solution whose pH is 3.45?

A. -3.45

B. 3.45

(C.) 10.55 ✓

D. 7.45

$pH + pOH = 14$

$3.45 + pOH = 14$

$pOH = 10.55$

9. Which of the following hydrogen ion concentrations represents a solution with acidic properties?

A. 1×10^{-10} M

B. 1×10^{-14} M

C. 1×10^{-8} M

(D.) 1×10^{-2} M ✓

10. The $[H^+]$ of a solution is 8.34×10^{-5} mole/liter. The pH of this solution lies between:

A. 5 and 6

B. 2 and 3

C. 3 and 4

(D.) 4 and 5 ✓

$pH = -\log [H_3O^+]$

$pH = -\log [8.34 \times 10^{-5} M]$

$pH = 4.08$