

Name: _____
Period: ____

Acids and Bases

(1) Complete the following table.

$[H^+]$	pH	pOH	$[OH^-]$	acidic, basic, or neutral?
$3.0 \times 10^{-2} M$				
		4.62		
	2.72			
			$1.6 \times 10^{-6} M$	
				neutral
$8.0 \times 10^{-5} M$				
	12.50			
		13.10		
			$8.7 \times 10^{-3} M$	

(2) Classify the following substances as acidic or basic and determine the $[H^+]$ and $[OH^-]$.

(a) Cola, pH = 3.50

(d) Human blood, pOH = 6.60

(b) Borax, pH = 8.85

(e) Vinegar, pOH = 11.60

(c) Stomach acid, pH = 1.45

(f) Sea water, pOH = 5.40

(3) Determine the pH and pOH of the following solutions.

(a) 0.34 M HBr

(c) 0.054 M H_2SO_4

(b) 0.42 M KOH

(d) 0.015 M $Al(OH)_3$

Answers:

(1)

$[H^+]$	pH	pOH	$[OH^-]$	acidic, basic, or neutral?
$3.0 \times 10^{-2} \text{ M}$	1.52	12.48	$3.3 \times 10^{-13} \text{ M}$	acidic
$4.2 \times 10^{-10} \text{ M}$	9.38	4.62	$2.4 \times 10^{-5} \text{ M}$	basic
$1.9 \times 10^{-3} \text{ M}$	2.72	11.28	$5.2 \times 10^{-12} \text{ M}$	acidic
$6.2 \times 10^{-9} \text{ M}$	8.20	5.80	$1.6 \times 10^{-6} \text{ M}$	basic
$1.0 \times 10^{-7} \text{ M}$	7.00	7.00	$1.0 \times 10^{-7} \text{ M}$	neutral
$8.0 \times 10^{-5} \text{ M}$	4.10	9.90	$1.3 \times 10^{-10} \text{ M}$	acidic
$3.2 \times 10^{-13} \text{ M}$	12.50	1.50	$3.2 \times 10^{-2} \text{ M}$	basic
$1.3 \times 10^{-1} \text{ M}$	0.90	13.10	$7.9 \times 10^{-14} \text{ M}$	acidic
$1.1 \times 10^{-12} \text{ M}$	11.94	2.06	$8.7 \times 10^{-3} \text{ M}$	basic

(2) Classify the following substances as acidic or basic and determine the $[H^+]$ and $[OH^-]$.

(a) $[H^+] = 3.2 \times 10^{-4} \text{ M}$, $[OH^-] = 3.2 \times 10^{-11} \text{ M}$, acidic

(b) $[H^+] = 1.42 \times 10^{-9} \text{ M}$, $[OH^-] = 7.1 \times 10^{-6} \text{ M}$, basic

(c) $[H^+] = 3.5 \times 10^{-2} \text{ M}$, $[OH^-] = 2.2 \times 10^{-13} \text{ M}$, acidic

(d) $[H^+] = 4.0 \times 10^{-8} \text{ M}$, $[OH^-] = 2.5 \times 10^{-7} \text{ M}$, basic

(e) $[H^+] = 4.0 \times 10^{-3} \text{ M}$, $[OH^-] = 2.5 \times 10^{-12} \text{ M}$, acidic

(f) $[H^+] = 2.5 \times 10^{-9} \text{ M}$, $[OH^-] = 4.0 \times 10^{-6} \text{ M}$, basic

(3) Determine the pH and pOH of the following solutions.

(a) pH = 0.47, pOH = 13.53

(b) pH = 13.62, pOH = 0.38

(c) pH = 0.97, pOH = 13.03

(d) pH = 12.65, pOH = 1.35