HW #26 #1-6, 8-11, 14, 15, 16

(1) Does not ionize very well. Kw is a small number.

(2) $[OH^-]$ → The concentration of Molarity.

(3) $1 \times 10^{-7} M = [H^+]$
No, more temperature means an increase in ionization.

(4) It is greater than $1 \times 10^{-7} M$ or $[OH^-]$

(5) the $-\log[H_3O^+] = pH$

(c) that it is a number to which the power is raised by base 10. Example 10^7 is 7.

(6) (A) Neutral (F) Acidic
(B) Basic (G) basic
(E) Neutral
(d) Acidic
(e) neutral

(8) (a) $[H_3O^+] = 0.030 M$ HC

$\frac{Kw}{[H_3O^+]} = [OH^-] = \frac{1.0 \times 10^{-14} M}{.030} = 3.33 \times 10^{-13} M$

(B) $[OH^-] = 1 \times 10^{-4} M$

$[H_3O^+] = \frac{Kw}{[OH^-]} = \frac{1 \times 10^{-14}}{1 \times 10^{-4}} = 1 \times 10^{-10} M$

(C) $[H^+] = 5.0 \times 10^{-3} M$

$[OH^-] = \frac{Kw}{[H^+]} = \frac{1 \times 10^{-14}}{5 \times 10^{-3}} = 2 \times 10^{-12} M$

(D) $[OH^-] = .020 M$

$[H^+] = \frac{Kw}{[OH^-]} = \frac{1 \times 10^{-14}}{.020} = 5 \times 10^{-13} M$

(9) (a) $pH = -\log[H^+] = -\log(1.0 \times 10^{-2} M)$

$pH = 2$

(B) $pH = -\log(1.0 \times 10^{-3} M)$
$= 3$

(C) $pH = -\log[H^+] = -\log 1 \times 10^{-5} = 5$

(D) $pH = -\log[H^+] = -\log(1 \times 10^{-4} M) = 4$

(10) (a) $[OH^-] = 1 \times 10^{-6} M$

$[H^+] = \frac{Kw}{[OH^-]} = \frac{1 \times 10^{-14}}{1 \times 10^{-6}} = 1 \times 10^{-8} M$

$pH = -\log 1 \times 10^{-8} = \boxed{8}$

(b) $[OH] = 1 \times 10^{-9} M$ $[H_3O^+] = \frac{K_w}{[OH^-]} = \frac{1 \times 10^{-14}}{1 \times 10^{-9}} = 1 \times 10^{-5} M$

$-\log[1 \times 10^{-5}] = \boxed{5}$

(C) $pH = -\log[1 \times 10^{-12}] = 12$

$[OH^-] = 1 \times 10^{-2} M$ $[H^+] = \frac{Kw}{[OH^-]} = \frac{1 \times 10^{-14}}{1 \times 10^{-2}} = 1 \times 10^{-12} M$

(D) $[OH^-] = 1 \times 10^{-7} M$
$[H_3O^+] = 1 \times 10^{-7} M$

$\boxed{pH = 7}$