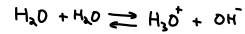


Assigned Problems From Last Class

K_w-ionization of Water

Water has H₂O molecules and H₃O⁺ and OH⁻ ions
 Recall- H₂O is amphoteric (both acidic + basic).



$$K_{eq} = \frac{[H_3O^+][OH^-]}{[H_2O][H_2O]}$$

Constants

new constant $K_w = [H_3O^+][OH^-]$ for all dilute solutions
 $k_w = (1.0 \times 10^{-7})(1.0 \times 10^{-7})$
 $K_w = 1.0 \times 10^{-14}$

Example- What is [OH⁻] of a solution with pH = 2.5

i) $pH = -\log [H_3O^+]$
 $2.5 = -\log [H_3O^+]$
 $[H_3O^+] = 0.0032 \text{ mol/L}$
 $1.0 \times 10^{-14} = (0.0032)[OH^-]$
 $\frac{1.0 \times 10^{-14}}{0.0032} = [OH^-] = 3.1 \times 10^{-12}$

Text p.566 #12,14

Example- weak acid/base

An acid, HX, has $K_a = 4.6 \times 10^{-8}$ what is [OH⁻] if the [HX] = 0.10 mol/L

(i)

	HX + H ₂ O		\rightleftharpoons		H ₃ O ⁺ + X ⁻	
I	0.10			0	0	
C	-x			+x	+x	
E	0.10-x			x	x	

$$K_a = \frac{[H_3O^+][X^-]}{[HX]} \rightarrow \frac{4.6 \times 10^{-8} = x^2}{0.10-x}$$

Assume...

(ii) $K_w = [H_3O^+][OH^-]$
 $1.0 \times 10^{-14} = 6.8 \times 10^{-9} [OH^-]$
 $1.6 \times 10^{-6} = [OH^-]$

Text - p.591 #5-10
 p.595 #11-16
 Worksheet - #5,6 + any others