

General Chemistry w/ Dr. Mattson

Today Section 15.1 - 15.7 (Last content day for CK2)
Feb 13

Tuesday 2/14 Review session @ 5-6:30 in Hitchcock 108

Wednesday 2/15 Section 15.8 - 15.10

Thursday 2/16 Expt 5

Friday 2/17: Celebration of Knowledge
Doors open 15 min before class

All (aq)



acetic acid

(ethanoic acid)

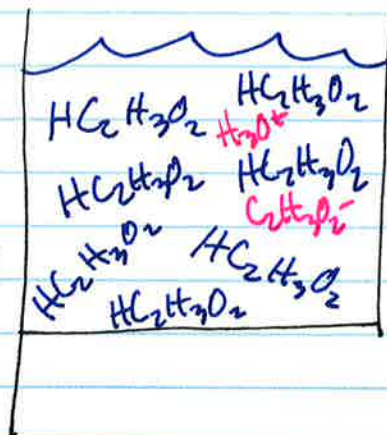
weak acid

(weak electrolyte)

(make only a few ions)

$$K_a = K_c = \frac{[\text{H}_3\text{O}^+][\text{C}_2\text{H}_3\text{O}_2^-]}{[\text{HC}_2\text{H}_3\text{O}_2]}$$

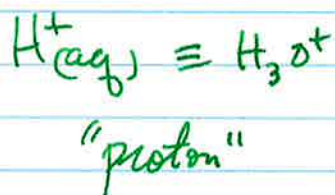
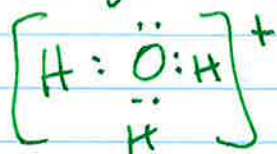
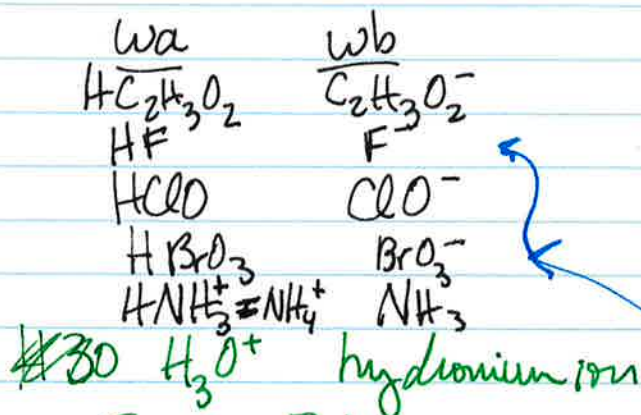
$$\approx 1.8 \times 10^{-5}$$



$$K_a = K_c = \frac{[\text{H}_3\text{O}^+][\text{F}^-]}{[\text{HF}]}$$

* Brønsted strong weak acids

Conjugate weak acid and weak base pairs



weak base

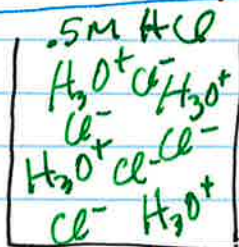
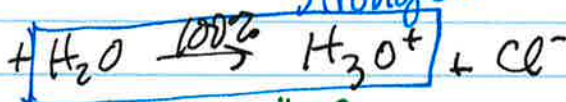
conjugate weak acid

$$K_c = \frac{[\text{OH}^-][\text{HF}]}{[\text{F}^-]}$$

Strong Acids

strong electrolyte

- HCl
- HBr
- HI
- HNO_3
- HClO_4
- H_2SO_4

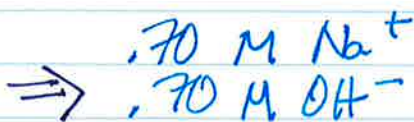
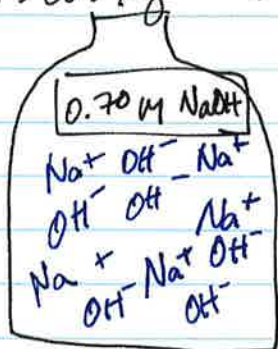


→ No HCl

$$K_c = \frac{[\text{H}_3\text{O}^+][\text{Cl}^-]}{[\text{HCl}]}$$

→ 0
← undefined

Strong Bases



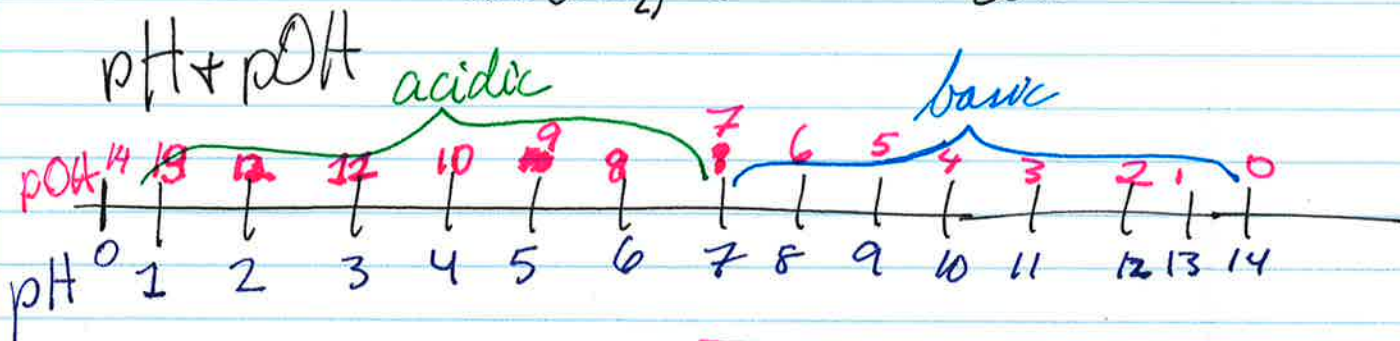
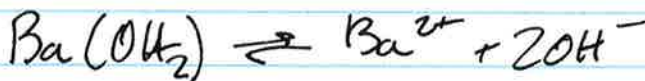
\rightarrow all Group I salts are soluble in water
 \rightarrow all ionic that dissolve dissociate 100% into ions in water

Strong Bases

LiOH
 NaOH
 KOH
 RbOH
 CsOH
 FrOH

All ~~OH~~ OH^- are generally insoluble except for Group I

Some Group II hydroxides are a little soluble



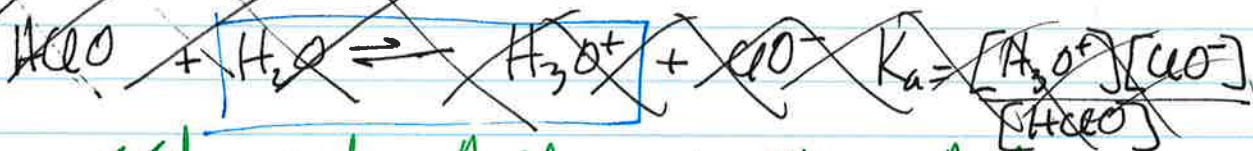
$$\text{pH} = -\log_{10} [\text{H}_3\text{O}^+]$$

$$[\text{H}_3\text{O}^+] = 10^{-\text{pH}}$$

$$\text{pOH} = -\log_{10} [\text{OH}^-]$$

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

~~Examples to know~~



~~weakest weak Acids~~

~~Strong Acid~~

HClO
weakest
of weak
acids



HClO₃
strongest
of weak
acids

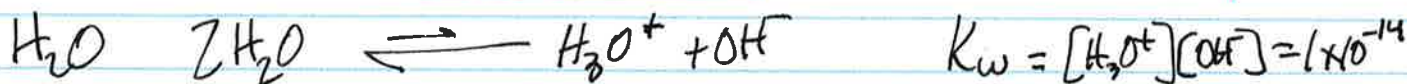
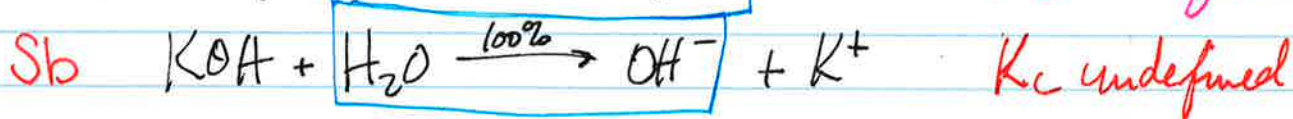
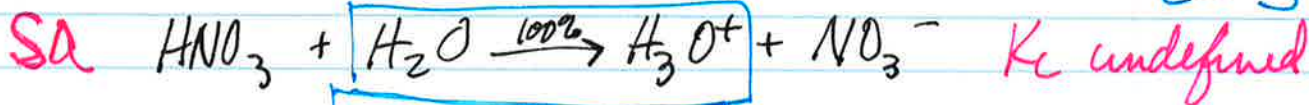
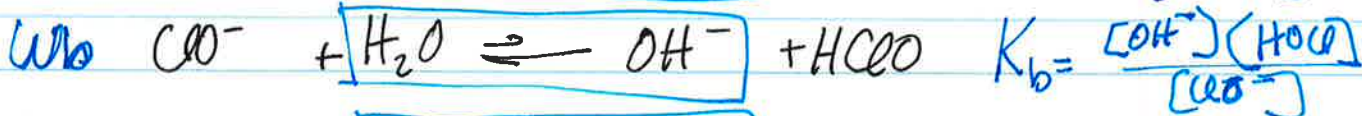
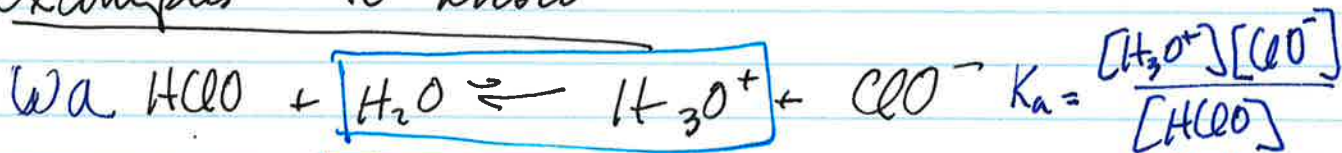


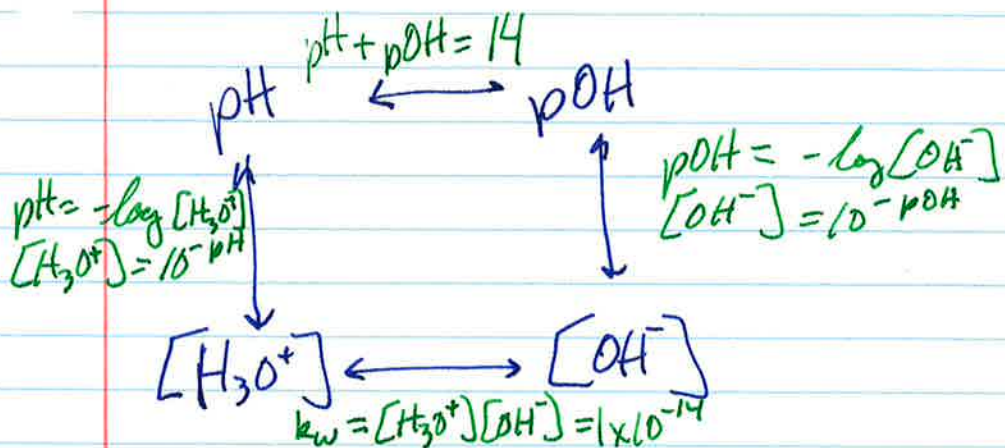
K_a 3.5 × 10⁻⁸

~ 0.2

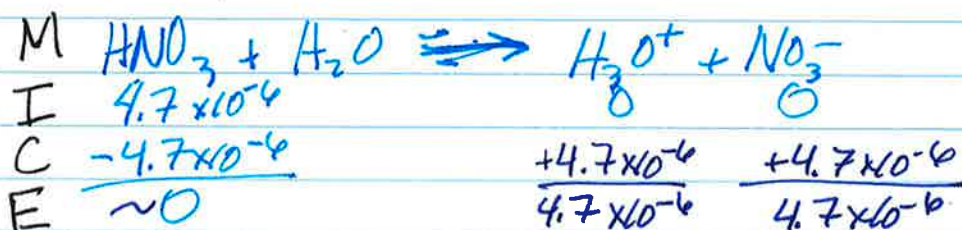
K_a → ∞

Examples to know





What is pH of 4.7×10^{-6} M HNO_3 sol'n?



$$[H_3O^+] = 4.7 \times 10^{-6}$$

because it's a strong acid

$$pH = -\log [4.7 \times 10^{-6}] = 5.32790$$

$$= 5.33$$

↳ this is not sig fig. it comes from exponent