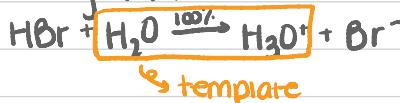


Strong Acid:



Warm-up #1:

What is the pH of a 0.075 M $\boxed{\text{HBr}}$ solution?

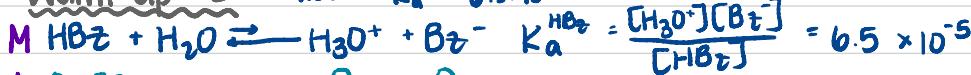
$$[\text{H}_3\text{O}^+] = 0.075 \text{ M}$$

$$\text{pH} = -\log(0.075)$$

$$= 1.12$$

what is the pH of 0.050 M benzoic acid, solution $\text{HC}_7\text{H}_5\text{O}_2(\text{aq})$

or "HBz" $K_a^{\text{benzoic}} = 6.5 \times 10^{-5}$



$$I \quad 0.050$$

$$O \quad 0$$

$$C \quad \frac{-X}{0.050-X}$$

$$\frac{+X}{X} \quad \frac{+X}{X}$$

$$\frac{x^2}{0.050-X} = 6.5 \times 10^{-5}$$

$$\frac{x^2}{0.050} = 6.5 \times 10^{-5}$$

$$x = 1.80 \times 10^{-3}$$

$$[\text{H}_3\text{O}^+] = 1.80 \times 10^{-3}$$

$$\text{pH} = 2.74$$

*400-mic: Is $\frac{[\text{HBz}]}{K_a^{\text{HBz}}} > 400$, if so, $x = \underline{\text{small enough to drop!}}$

smaller, the better

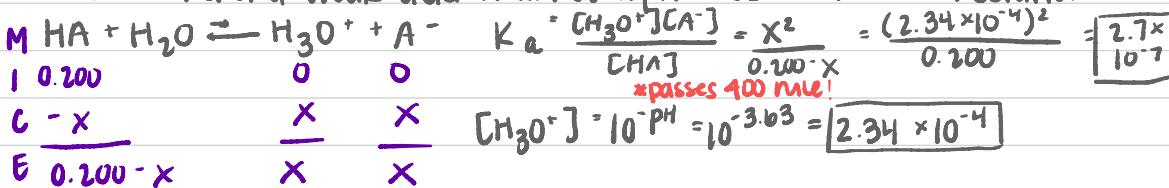
$$K_a = 1 \times 10^{-2}$$

$$1 \times 10^{-5}$$

$$1 \times 10^{-8} \quad \text{BEST}$$

$$\text{Percent Dissociation} = 100\% \cdot \frac{x}{[\text{HBz}]_I} = 3.6\%$$

what is the K_a of a weak acid that has a pH = 3.63 as a 0.200 M solution?



$$I \quad 0.200$$

$$O \quad 0$$

$$C \quad \frac{-X}{0.200-X}$$

$$[\text{H}_3\text{O}^+] = 10^{-\text{pH}} = 10^{-3.63} = 2.34 \times 10^{-4}$$

Today, February 19th
Lab tomorrow:
Expt. 9

February 19th

$$K_a = 2.7 \times 10^{-7} \rightarrow pK_a = -\log K_a = 6.561029996$$

$$K_a = 10^{-pK_a}$$

↳ how much of # do I keep??

Strong Acid



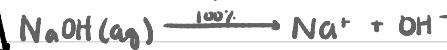
↳ template!
↳ template!



Strong Bases

group I hydroxides

↳ LiOH, NaOH, KOH, etc.



ex: what is the pH of a 2.7×10^{-4} M

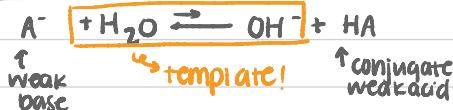
$$[\text{OH}^-] = 2.7 \times 10^{-4} \text{ M}$$

$$\text{pOH} = -\log(2.7 \times 10^{-4})$$

$$= 3.5 \quad 7 \text{ sigfigs!}$$

$$\text{pH} = 10.43$$

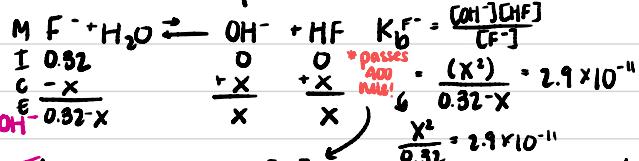
Weak Bases



$$\text{pH} = \text{pOH}$$

$$\text{pH} + \text{pOH} = 14.00$$

→ what is the pH of a 0.32 M F⁻ solution?



↳ strong base

*conjugate weak acid + weak base pairs

Weak Acid

most acidic + lowest pH

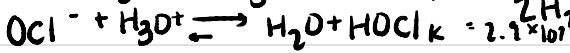
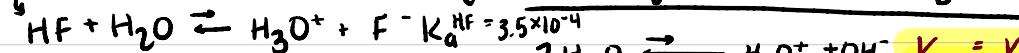
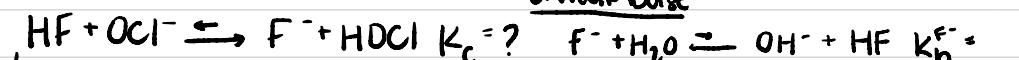
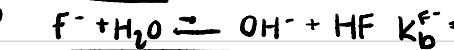


↑ best weak base, highest pH

Weak Acid



C. weak base



$$K = 1 \times 10^4$$

$$K_w = K_a * K_b$$

$$(in general...) K_w = K_a * K_b$$

$$1.0 \times 10^{-14} = 3.0 \times 10^{-4} * K_b$$

$$K_b = 2.9 \times 10^{-11}$$