

General Chemistry II w/ Doc M

Today

Feb 2/22 Finish Chp 15

Tomorrow

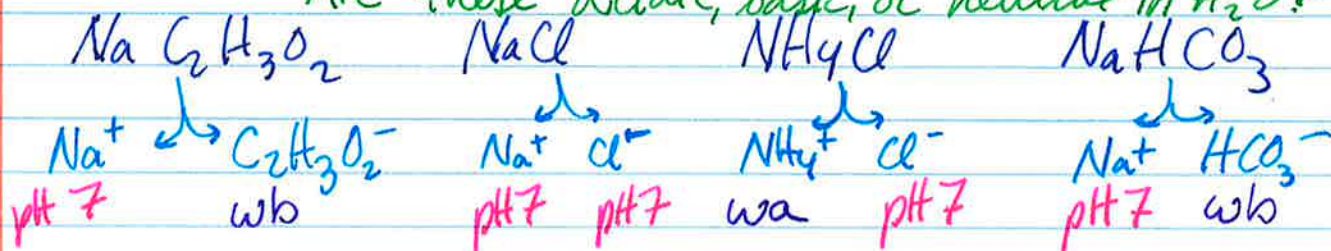
Thursday 2/23

Bring Laptop w/ Excel
Review interpolation (Prelab)
Form basis for Expt 7
"practical" next week

Friday 2/24 Start Chp 16

Sunday 2/26 Review session 5-6:30 pm HTTC 108

Are these acidic, basic, or neutral in H_2O ?



* wb pH > 7 pH neutral wa pH < 7 wb pH > 7

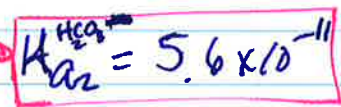
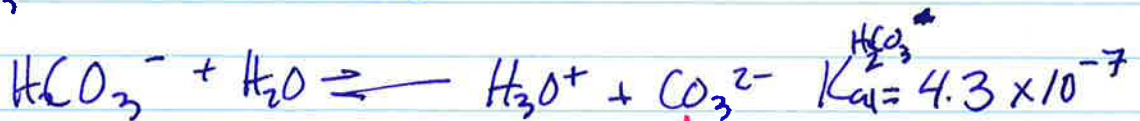
* Notes

1 All Group I and II cations are pH neutral
 Li^+ Na^+ Rb^+ K^+ Cs^+ Fr^+

2 Anions of monoprotic strong acids are pH neutral
 Cl^- Br^- I^- NO_3^- ClO_4^-



HCO_3^- as a weak acid



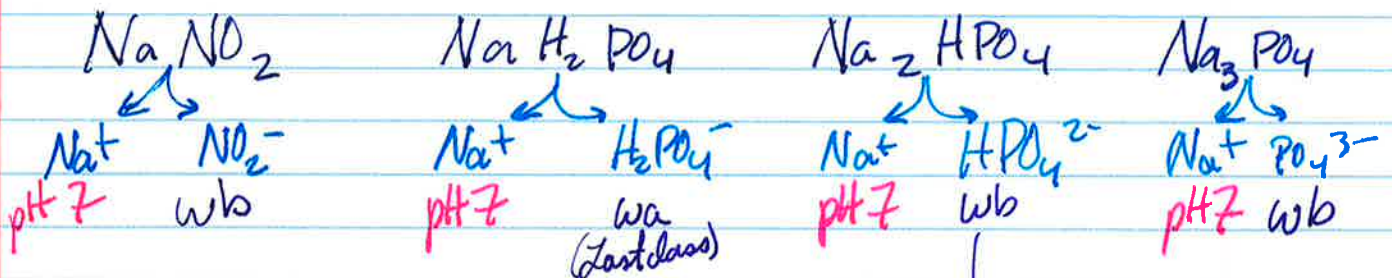
HCO_3^- as a weak base $\rightleftharpoons \text{OH}^- + \text{H}_2\text{CO}_3$

$K_b^{\text{HCO}_3^-} = \frac{K_w}{K_{a1}} = \frac{10^{-14}}{4.3 \times 10^{-7}}$

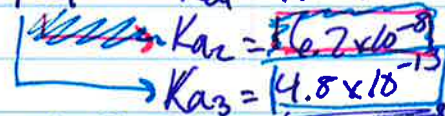
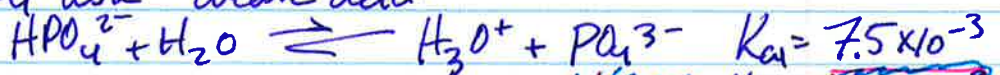
$2.3 \times 10^{-8} > 5.6 \times 10^{-11}$

$= 2.3 \times 10^{-8}$

So HCO_3^- acts better as a weak base



HPO_4^{2-} as a weak acid

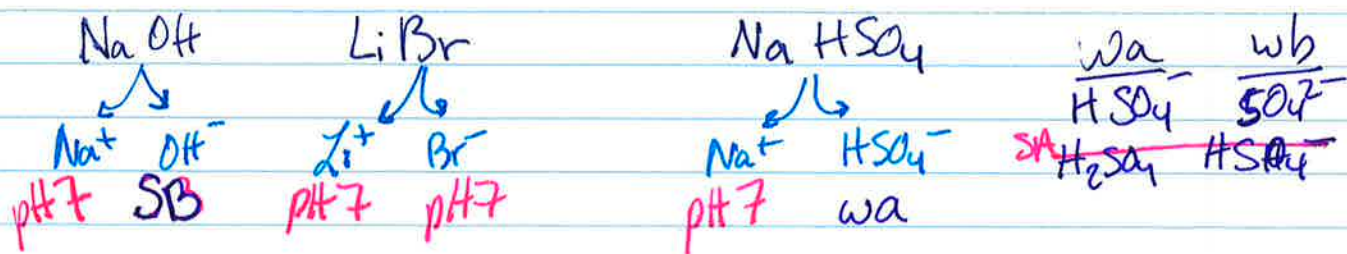


HPO_4^{2-} as a weak base



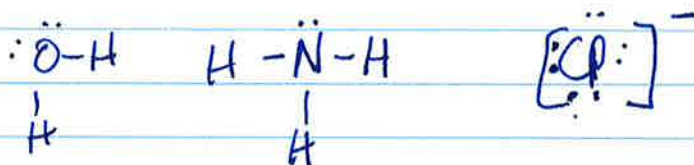
$1.6 \times 10^{-7} = K_b = \frac{K_w}{K_{a2}} = \frac{1 \times 10^{-14}}{6.2 \times 10^{-8}}$

$1.6 \times 10^{-7} > 4.8 \times 10^{-13}$ so HPO_4^{2-} acts as wb



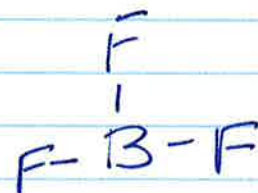
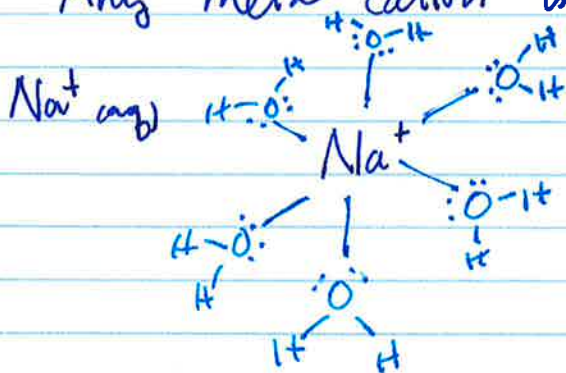
Lewis Acids + Bases

Lewis base: molecules / ions with an electron pair in the Lewis dot structure

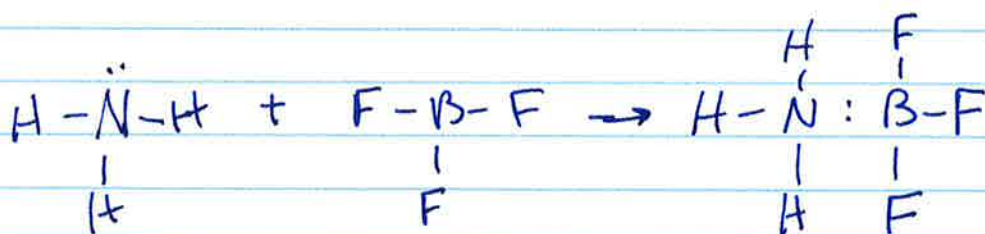


Lewis acids "want" electron pairs

Any metal cation is a Lewis acid



← B has 6 valence electrons



$$\text{HF} \quad K_a^{\text{HF}} = 3.5 \times 10^{-4}$$

$$\text{HBz} \quad K_a^{\text{HBz}} = 6.5 \times 10^{-5}$$

if we had a 1.0 M sol'n
 $[\text{H}_3\text{O}^+] = 1.8 \times 10^{-2}$ pH 1.73

← better weak acid

$$8.06 \times 10^{-3} \quad 2.09$$



$$K_a^{\text{HF}} = 3.5 \times 10^{-4}$$



$$K_c = \frac{1}{K_a^{\text{HBz}}} = \frac{1}{6.5 \times 10^{-5}} = 1.54 \times 10^4$$



$$K = \frac{K_a^{\text{HF}}}{K_a^{\text{HBz}}} = \frac{3.5 \times 10^{-4}}{6.5 \times 10^{-5}} = 5.4$$

go towards products