Chemistry **Name**_____

Pretest 3.2 v 2016

1. Write 2 chemical equations to show how HSO_3^- acts as an acid. One will do it the Arrhenius way and the other will act as a Bronsted-Lowry acid.

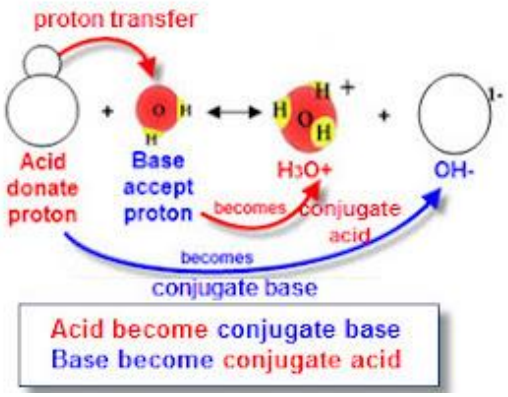
2. Identify two Bronsted-Lowry bases in the following equation.

$$C_2H_4O_{2\,(aq)} + AsH_{3(aq)} \rightleftharpoons AsH_4^+{}_{(aq)} + C_2H_3O_2^-{}_{(aq)}$$

Also see the animation, showing the difference between acids with a high Ka(strong acids) versus those with low Ka(weak acids). Click on the links below the pretest 3.2 answers.

3. If the pH of a solution is 8.57, what is its $[OH^-]$?

4. If the concentration of H^+ is 0.00440 moles/L, what is its pOH?



5. If the acid HX has an equilibrium concentration of 0.600 M and a pH of 2.00, what is its K_A value?

$$HX_{(aq)} \rightleftharpoons H^+{}_{(aq)} + X^-{}_{(aq)}$$

6. The K_A for HNO_2 is 4.5×10^{-4}.

Calculate the equilibrium concentration of NO_2^{-1} in a solution of HNO_2 initially prepared as 0.00010 M. **Again show ICE chart.**

7. Dimethylamine, $(CH_3)_2NH$, is a weak base. The dissociation of dimethylamine and its ionization constant, K_b, are shown below.

$$(CH_3)_2NH_{(aq)} + H_2O_{(l)} \rightleftharpoons OH^-_{(aq)} + (CH_3)_2NH_2{}^+_{(aq)} \qquad K_b = 5.1 \times 10^{-4}$$

A chemistry student places 3.1×10^{-2} grams of dimethylamine into 5.0×10^2 mL of distilled water. Find its pH.

8. Start with $K_AK_B = K_w$.
and use logs and log laws to relate the sum of pK_A and pK_B to the sum of pH and pOH.
(4 m)

9. Use the K_{sp} for calcium fluoride to calculate its solubility in grams per liter. (CaF_2: $K_{sp} = 4.0 \times 10^{-11}$)

10. What is the solubility in moles/L of $AlPO_4$ in 0.050 M Na_3PO_4?
Ksp of $AlPO_4$ = **9.84×10^{-21}**

11. Determine the oxidation number for each atom in the following molecules and calculate the total contribution by the atom.

a) $AlCl_3$
b) $OCl-$
c) Mg^{2+}
d) $KClO_3$

Flashbacks

- One question from an old final. It could be on any topic.
- A calculation based on mixing problems (calorimetry), where a hot substance transfers its heat to a cooler liquid in a calorimeter. Watch those signs, and remember that after the heat-transfer, the mixture reaches a common final temperature.