Name:_____
Blk:___Date:_____

CHEMISTRY 12
ACID BASES UNIT
Lesson #10

THE RELATIVE STRENGTHS OF ACIDS AND BASES

Example 1. If solutions containing H_2CO_3 and SO_3^{2-} are mixed, the following acid base equilibrium exists:

Here SO_3^{2-} must act as the _____ as it _____!

Example 2: If solutions containing CO_3^{2-} and $H_2PO_4^-$ are mixed, the following acid-base equilibrium exists:

In the above two equilibrium there are acids on BOTH SIDES of the equation, just as there are bases on both sides of the equation. However, in a BRONSTED-LOWRY acid-base equilibrium the side of the equilibrium that is favoured is the side with the _____!!!!

Therefore, in **Example 1** the side of the equilibrium that is favoured is determined by comparing the strengths of the TWO ACIDS. Because_____ is a weaker acid than_____, the _____ are favoured.

In **Example 2** the side of the equilibrium that is favoured is also determined by comparing the strengths of the TWO ACIDS. Because_____ is a weaker acid than_____, the _____ are favoured.

Here is another way of determining which side is favoured in a Bronsted-Lowry acid-base equilibrium:

Using the chemical equation from **Example 2**:

$$CO_3^{2-} + H_2PO_4^- \text{<----> } HCO_3^- + HPO_4^{2-}$$

Write out the Keq expression:

The Keq expression can be RE-WRITTEN AS:

OR SIMPLY AS:

RECALL:
If the Keq value = 1 _____
If the Keq value > 1 _____
If the Keq value < 1 _____

THE GENERIC Keq expression for acid-base equilbria is:

$$Keq = \frac{Ka(\text{REACTANT ACID})}{Ka\ (\text{PRODUCT ACID})}$$

Example 3. When HS^- and HCO_3^- are mixed, does the resulting equilibrium favour the reactant or the products?
1. Choose which of these two reactants is going to act as the acid.

2. Write out the acid-base equilbrium:

3.Identify the TWO ACIDS involved in the equilibrium:

a. Solve the problem using the WEAKER ACiD rule

b. Solve the problem using the Keq equation

SEATWORK/HOMEWORK: Exercises 38-46 in Hebden pg 131
PLO's: K8+K9