Name:_____
Blk:_____Date:_____

Chemistry 12
ACID BASE LESSON #9
THE RELATIONSHIP BETWEEN K_a and K_b FOR A CONJUGATE PAIR

Experimentally it is found that the ACID IONIZATION equation:

$$NH_4^+ (aq) + H_2O(l) \leftrightarrow NH_3 (aq) + H_3O^+ (aq)$$

Has the acid ionization constant of:

K_a =

While the BASE IONIZATION eqaution:

$$NH_3 (aq) + H_2O(l) \leftrightarrow NH_4^+ (aq) + OH^- (aq)$$

Has the BASE IONIZATION CONSTANT of:

K_b=

Since both equations involve both _____, the following relationship exists between the K_a and K_b for CONJUGATE PAIRS

$K_a \times K_b$ =

Conclusion: for A CONJUGATE PAIR:

K_a (conjugate acid) x K_b(conjugate base) = Kw

Recall that the table of Relative Strengths of Acids and Bases is set up with only K_a values. You can use the above equation to solve for the K_b.

Kb(conjugate base)=

Example 1. What is the K_b for $H_2PO_4^-$?

Example 2. What is the K_b for HS^- ?

Example 3. Given that the Kb for N_4H_6 is 2.14×10^{-12}, what is the Ka for $N_4H_7^+$?

SEATWORK/HOMEWORK: Exercises 35-37 in Hebden
PLO's: M1-M2 and M4