

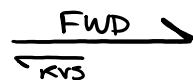
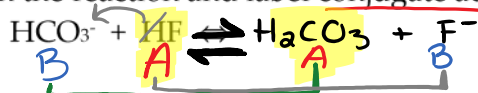
VIII) Determine Whether Reactants or Products are Favored in an Acid/Base Reaction

January 17, 2018 11:07 PM

* Quiz Thursday *

VIII) Determining Whether Reactants or Products are Favoured in an Acid/Base Reaction

Finish the reaction and label conjugate acids and bases:



What do acids do that make them acids? *donate H⁺ proton*

There is a competition between the two acids ^AHF and ^AH₂CO₃ to donate the proton, and this will have repercussions as to what side is favoured.

Which of the two is the stronger acid?

HF is the stronger (weak) acid

So which side of the equilibrium will be favoured?

$$K_{eq} = \frac{[\text{products}]}{[\text{reactants}]}$$

Will the K_{eq} be greater than or less than 1?

when products are favoured, $K_{eq} > 1$

RULE: The side of the reaction with the weaker acid is always favoured.

*The products will be favored because, HF acid is better at donating H⁺ (it will dissociate more than H₂CO₃) this causes the FWD rxn to predominate over the reverse rxn.
∴ products are produced faster than they are used up.
∴ "products are favored"*

* Assignment 5: State whether reactants or products are favoured.

1. $\text{NH}_4^+ + \text{H}_2\text{O} \rightleftharpoons \text{NH}_3 + \text{H}_3\text{O}^+$
2. $\text{H}_2\text{S} + \text{NH}_3 \rightleftharpoons \text{HS}^- + \text{NH}_4^+$
3. $\text{H}_2\text{PO}_4^- + \text{HS}^- \rightleftharpoons \text{HPO}_4^{2-} + \text{H}_2\text{S}$
4. $\text{H}_2\text{O}_2 + \text{SO}_3^{2-} \rightleftharpoons \text{HO}_2^- + \text{HSO}_3^-$
5. $\text{CH}_3\text{COOH} + \text{PO}_4^{3-} \rightleftharpoons \text{CH}_3\text{COO}^- + \text{HPO}_4^{2-}$
6. $\text{H}_2\text{PO}_4^- + \text{C}_2\text{O}_4^{2-} \rightleftharpoons \text{HPO}_4^{2-} + \text{HC}_2\text{O}_4^-$
7. $\text{H}_2\text{SO}_3 + \text{SO}_4^{2-} \rightleftharpoons \text{HSO}_3^- + \text{HSO}_4^-$