

0.020M

$$K_b = 1.62 \times 10^{-6}$$

$$K_b = \frac{[\text{H-CoO}_{(aq)}^+][\text{OH}^-_{(aq)}]}{[\text{CoO}_{(aq)}]}$$

$$[\text{H-CoO}_{(aq)}^+] = [\text{OH}^-_{(aq)}]$$

$$K_b = \frac{[\text{OH}^-_{(aq)}]^2}{[\text{CoO}_{(aq)}]}$$

$$\text{pOH} = -\log[\text{OH}^-_{(aq)}]$$

$$\text{pOH} = -\log[1.8 \times 10^{-4}]$$

$$\text{pOH} = 3.74$$

$$[\text{OH}^-_{(aq)}] = \sqrt{(1.62 \times 10^{-6})(0.020)}$$

$$[\text{OH}^-_{(aq)}] = 1.8 \times 10^{-4} \text{ M}$$

$$\text{pH} + \text{pOH} = 14.00$$

$$\text{pH} = 14.00 - 3.74$$

$$\boxed{\text{pH} = 10.26}$$

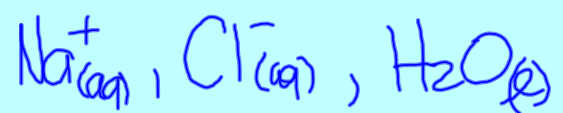
Pure Substance

Entities in Water

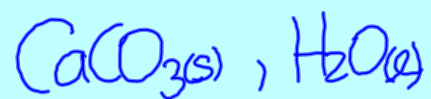
....Think High vs. Low Solubility



high



low



Pure Substance

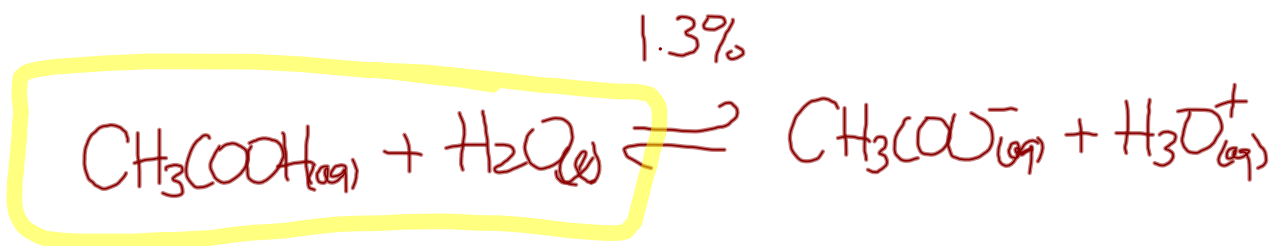
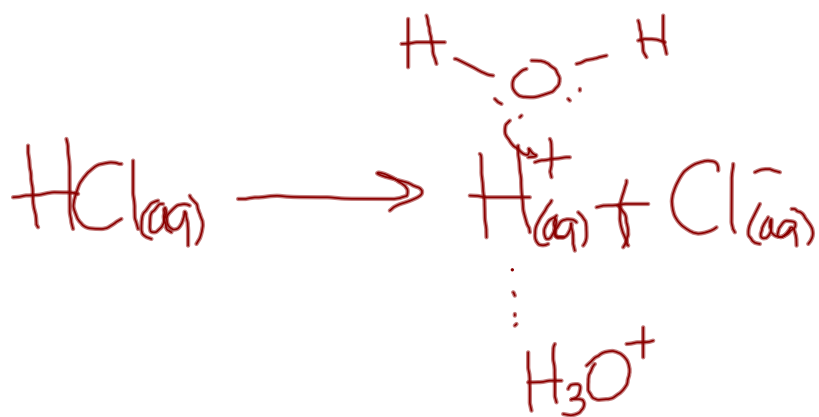
Entities in Water

....Think High vs. Low Solubility



Strong vs. Weak Acid





Predicting Acid-Base Reactions

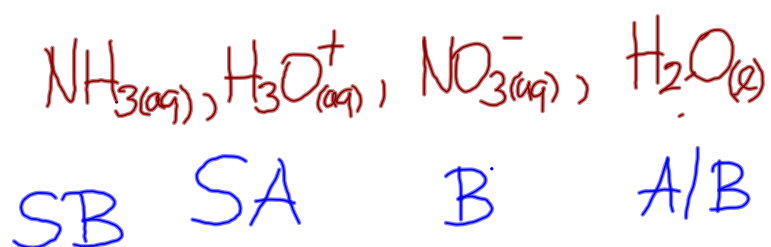
1. List all entities (ions, atoms, or molecules) initially present.
2. Identify all possible acids and bases, using Bronsted-Lowry definition.
3. Identify the strongest acid and strongest base, using table of acids and bases.
4. Transfer one proton from the acid to the base and predict the conjugate acid and conjugate base as products.
5. Predict the position of the equilibrium.

Sample Problem

Ammonium nitrate fertilizer is produced by the **quantitative** reaction of aqueous ammonia with nitric acid. Write a balanced acid-base equilibrium equation.

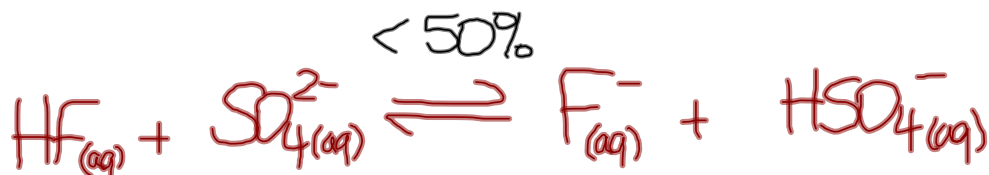
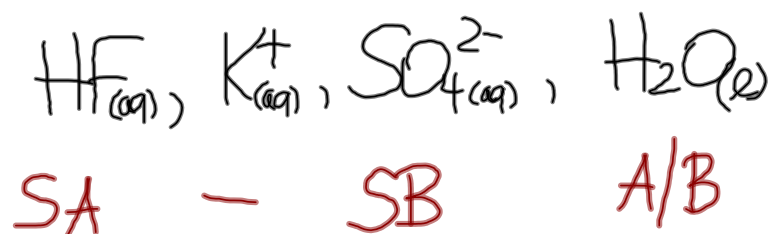


All entities in solution:



Sample Problem

Write a balanced acid-base equilibrium equation for the reaction of hydrofluoric acid and potassium sulfate.



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Homework

Predicting Acid-Base Equilibria

Worksheet