Exercises for Acids and Bases (Review)

1. Indicate whether an aqueous solution of each of the following ionic substances is acidic, basic or neutral? Explain your choice in each case.
   
a) NaBr     c) NH₄Cl     e) (CH₃)₄NCl
   b) KC₂H₃O₂   d) Na₃PO₄   f) Fe(NO₃)₃

2. Identify the reactant that is a Brønsted-Lowry acid in each of the following reactions.
   
a) KCN + HI ⇌ HCN + KI
   b) PO₄³⁻ + H₂O ⇌ HPO₄²⁻ + OH⁻

3. Identify the acid-base conjugate pairs in the following reactions.
   
a) \( \text{H₃NCH₂CH₂NH₃} + \text{H₂O} ⇌ \text{H₃NCH₂CH₂NH₂} + \text{H₃O}⁺ \)
   
b) \[ \text{Benzoic acid} + \text{Pyridine} \rightleftharpoons \text{Benzoate} + \text{Pyridinium} \]

4. Why is the pH of deionized water usually less than 7?

5. Calculate the [H+] and pH of each of the following aqueous solutions.
   
a) 0.010 M HNO₃
   b) 0.035 M KOH

6. List the common strong acids and strong bases.

7. Write a balanced equation associated with \( K_{a2} \) of H₃PO₄ and \( K_{b2} \) for Na₂C₂O₄.

8. Write a balanced equation for the base hydrolysis of CN⁻ and calculate \( K_b \) for this reaction.

Solutions for Acids and Bases Exercises