

Acids and Bases

Section 18.1 Introduction to Acids and Bases

pages 634–643

Practice Problems

pages 635–640

1. Write balanced equations for reactions between the following.

a. aluminum and sulfuric acid



b. calcium carbonate and hydrobromic acid



2. **Challenge** Write the net ionic equation for the reaction in question 1b.



3. Identify the conjugate acid-base pairs in the following reactions.



Acid	Conjugate base	Base	Conjugate acid
a. NH_4^+	NH_3	OH^-	H_2O
b. HBr	Br^-	H_2O	H_3O^+
c. H_2O	OH^-	CO_3^{2-}	HCO_3^-

4. **Challenge** The products of an acid-base reaction are H_3O^+ and SO_4^{2-} . Write a balanced equation for the reaction and identify the conjugate acid-base pairs.



Reactant base: H_2O ; conjugate acid: H_3O^+

Reactant acid: HSO_4^- ; conjugate base: SO_4^{2-}

Section 18.1 Assessment

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5. **Explain** why many Lewis acids and bases are not classified as Arrhenius or Brønsted-Lowry acids and bases.

A Lewis acid is an electron pair acceptor and a Lewis base is an electron pair donor. A Lewis acid may not have an ionizable hydrogen ion or hydroxide ion to qualify as an Arrhenius acid or base. A Lewis acid may not have a hydrogen ion to donate, so that it could not qualify as a Brønsted-Lowry acid. However, all Lewis bases are Brønsted-Lowry bases because they can accept a hydrogen ion.

6. **Compare** the physical and chemical properties of acids and bases.

Physical Properties: Acids taste sour and conduct electricity. Bases taste bitter, feel slippery, and conduct electricity.

Chemical Properties: Acids react with some metals to produce hydrogen gas and with carbonates to produce carbon dioxide. Acids turn blue litmus red. Bases react with acids and turn red litmus blue.

7. **Explain** how the concentrations of hydrogen ions and hydroxide ions determine whether a solution is acidic, basic, or neutral.

In an acidic solution, $[\text{H}^+] > [\text{OH}^-]$; in a neutral solution, $[\text{H}^+] = [\text{OH}^-]$; in a basic solution, $[\text{H}^+] < [\text{OH}^-]$.

Acids And Bases Solutions Manual

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Acids And Bases Solutions Manual:

The Practice of Chemistry Study Guide & Solutions Manual Pamela Mills, Amina El-Ashmawy, 2003-04-14 Designed to help students understand the material better and avoid common mistakes Also includes solutions and explanations to odd numbered exercises

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