

MIXED REVIEW

34. Suppose that dilute $\text{HNO}_3(aq)$ and $\text{LiOH}(aq)$ are mixed in chemically equivalent quantities. Write the following for the resulting reaction:
- formula equation
 - overall ionic equation
 - net ionic equation
35. Write the balanced chemical equation for the reaction between hydrochloric acid and magnesium metal.
36. Write equations for the three-step ionization of phosphoric acid, H_3PO_4 . Compare the degree of ionization for the three steps.
37. Name or give the molecular formula for each of the following acids:
- | | |
|----------------------------|----------------------------|
| a. HF | f. hydrobromic acid |
| b. acetic acid | g. HClO |
| c. phosphorous acid | h. H_2CO_3 |
| d. HClO_4 | i. sulfuric acid |
| e. H_3PO_4 | |

CRITICAL THINKING

38. **Analyzing Conclusions** In the 18th century, Antoine Lavoisier experimented with oxides, such as CO_2 and SO_2 . He observed that they formed acidic solutions. His observations led him to infer that to exhibit acidic behavior, a substance must contain oxygen. However, today that inference is known to be incorrect. Provide evidence to refute Lavoisier's conclusion.



USING THE HANDBOOK

39. Group 16 of the *Elements Handbook* contains a section covering the acid-base chemistry of oxides. Review this material, and answer the following questions:
- What types of compounds form acidic oxides?
 - What is an acid anhydride?
 - What are three examples of compounds that are classified as acid anhydrides?
 - What types of compounds form basic oxides? Why are they basic oxides?
40. a. Look at Table 7A in the *Elements Handbook*. What periodic trends regarding the acid-base character of oxides do you notice?
b. How is the nature of the product affected by the concentrations of the reactants?

RESEARCH & WRITING

41. Explain how sulfuric acid production serves as a measure of a country's economy. Write a report on your findings.
42. **Performance** Conduct library research to find out about the buffering of solutions. Include information on why solutions are buffered and what kinds of materials used as buffers. Write a brief report on your findings.
43. Obtain some pH paper from your teacher. Determine whether the soil around your house is acidic or basic. Find one type of plant that would grow well in the type of soil around your home and one that would not grow well.

ALTERNATIVE ASSESSMENT

44. Antacids are designed to neutralize excess hydrochloric acid secreted by the stomach during digestion. Carbonates, bicarbonates, and hydroxides are the active ingredients in the most widely used antacids. These ingredients act to drive the neutralization reactions. Examine the labels of several common antacids, and identify the active ingredients.
45. Design an experiment that compares three brands of antacids in terms of the speed of symptom relief and amount of acid neutralized.