
500 mL
±5%
400
300

CHAPTER 9

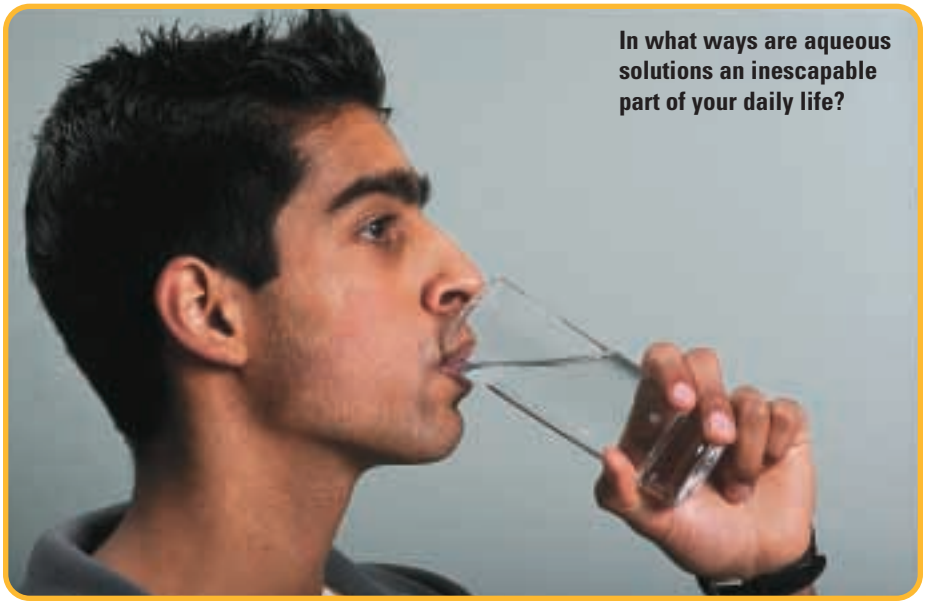
Aqueous Solutions

In 1966, a Russian scientist who was lecturing in England stunned the scientific community with the report of a new discovery. He said that a colleague had isolated a new form of liquid water. Dubbed "polywater," this substance was prepared in a laboratory by heating and then condensing $H_2O_{(g)}$ in very narrow glass capillary tubes. Over the next seven years, scientists around the world conducted studies and published over 500 papers about polywater's properties. For example, its boiling point, density, and viscosity were greater than those of ordinary water. Its freezing point was lower.

Then the popular media took an interest. They turned a simmering scientific curiosity into a boiling concern. Polywater apparently had a powerful capacity for hydrogen bonding. What if it escaped from a laboratory? There were dire predictions that polywater would "take over" Earth's water resources. The imagined consequences for life on Earth were grim.

Eventually further studies revealed that polywater was simply a concentrated solution of silicon (silicic acid) and several ionic compounds in ordinary water. The glass tubing was the source of these solutes. They had leached into the water.

The polywater event occurred because scientists overlooked, for awhile, water's remarkable power as a solvent. In this chapter, you will learn how to predict which compounds are soluble in water. As well, you will consider how chemical reactions in aqueous (water) solutions are useful in industry and in protecting the quality of our water supplies.



In what ways are aqueous solutions an inescapable part of your daily life?

Chapter Preview

Concepts and Skills You Will Need

Before you begin this chapter, review the following concepts and skills:

- identifying factors that affect solubility (Chapter 8, section 8.2)
- performing stoichiometry calculations (Chapter 7, section 7.1)