Concentration and Solubility

(pages 230–235)

Concentration (pages 230–231)

Key Concept: **To measure concentration, you compare the amount of solute to the amount of solvent or to the total amount of solution.**

- A **dilute solution** is a mixture that has only a little solute dissolved in a certain amount of solvent. Tree sap is a dilute solution.
- A **concentrated solution** is a mixture that has a lot of solute dissolved in a certain amount of solvent. Maple syrup is a concentrated solution.
- A solution becomes more concentrated if you add solute or take away solvent. A solution becomes more dilute if you add solvent.
- You can describe concentration in either grams or milliliters. But you must measure both the solute and the solvent with the same units. Then you can compare the amount of solute dissolved in the solvent.

Answer the following questions. Use your textbook and the ideas above.

1. A mixture that has a lot of solute dissolved in a certain amount of solvent is a(an) _____ solution.

2. A mixture that has only a little solute dissolved in a certain amount of solvent is a(an) _____ solution.

3. Is the following sentence true or false? You can change the concentration of a solution by adding solute.

_____

Solubility (pages 231–232)

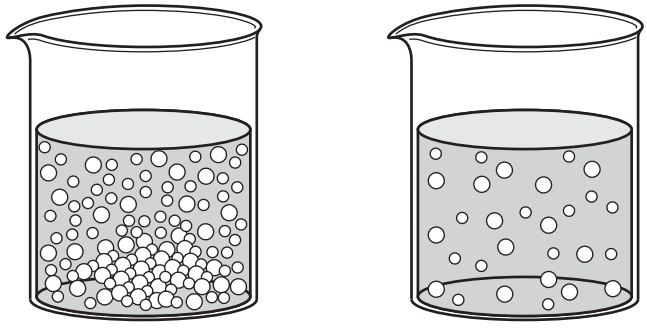
Key Concept: **Solubility can be used to help identify a substance because it is a characteristic property of matter.**

- **Solubility** describes how much solute can dissolve in a solvent at a given temperature.
- A **saturated solution** is a solution that has so much solute that no more solute will dissolve. A saturated solution is filled up with solute.
- An **unsaturated solution** is a solution that can still dissolve more solute. An unsaturated solution has room to add more solute.
- Solubility tells you how much solute you can dissolve before the solution becomes saturated, or filled up. For example, more sugar than salt will dissolve in 100 g of water. Sugar is more soluble than salt.
- Solubility is a physical property of a substance. You can use solubility to identify an unknown substance.

Answer the following questions. Use your textbook and the ideas above.

4. _____ tells how much solute can dissolve in a solvent at a given temperature.

5. The pictures show sugar dissolved in water. Circle the letter of the picture that shows a saturated solution.



a. **b.**

Factors Affecting Solubility (pages 232–235)

Key Concept: **Factors that affect the solubility of a substance include pressure, the type of solvent, and temperature.**

- Pressure affects the solubility of gases. At high pressure, more gas dissolves. Think of opening a soft drink bottle. When you remove the cap, the pressure inside the bottle gets lower and the gas escapes.
- The kind of solvent affects solubility. For example, oil and water do not mix. Oil is a nonpolar compound. Water is a polar compound. Polar compounds and nonpolar compounds do not mix well.
- Temperature affects solubility. At high temperatures, more solid can dissolve. For example, more sugar dissolves in boiling water than in cold water. When the solution cools, the extra sugar stays dissolved. The solution is a **supersaturated solution** because the solution is holding more solute than it normally could. The solution is "super full."

Answer the following question. Use your textbook and the ideas above.

6. Complete the concept map about solubility.