Section 14.3 Solvation and Solubility?

In your textbook, read about the characteristics of solutions.

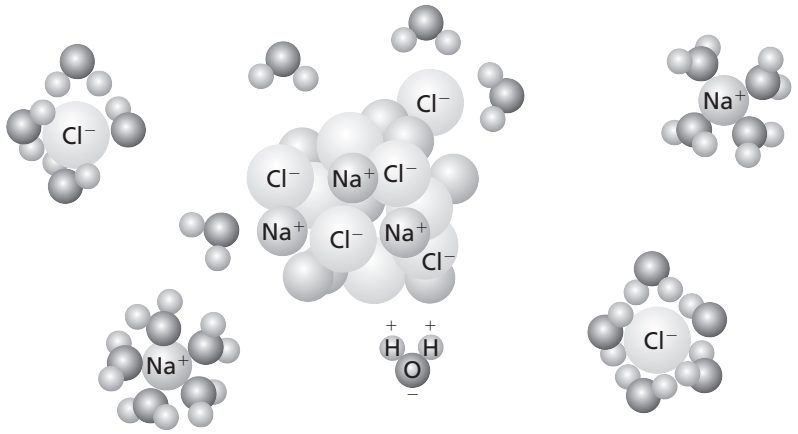
Use each of the terms below just once to complete the passage.

immiscible	liquid	soluble	solution
insoluble	miscible	solute	solvent

Air is a(n) **(1)**_____ of oxygen gas dissolved in nitrogen gas. The oxygen in air is the **(2)**_____, and nitrogen is the **(3)**_____. Because oxygen gas dissolves in a solvent, oxygen gas is a(n) **(4)**_____ substance. A substance that does not dissolve is **(5)**_____. **(6)**_____ solutions are the most common type of solutions. If one liquid is soluble in another liquid, such as acetic acid in water, the two liquids are **(7)**_____. However, if one liquid is insoluble in another, the liquids are **(8)**_____.

Read about solvation in aqueous solutions in your textbook.

The diagram shows the hydration of solid sodium chloride to form an aqueous solution. Use the diagram to answer the following questions.



9. Hydration is solvation in which the solvent is water. What is solvation?

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_____

Section 14.3 *continued*

10. As sodium chloride dissolves in water, what happens to the sodium and chloride ions?

_____

_____

11. Explain the orientation of the water molecules around the sodium ions and chloride ions.

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12. How does the strength of the attraction between water molecules and sodium and chloride ions compare with the strength of the attraction between the sodium ions and chloride ions? How do you know?

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13. List three ways that the rate of solvation may be increased.

_____

_____

In your textbook, read about heat of solution, solubility, and factors that affect solubility.

For each statement below, write *true* or *false*.

_____ **14.** The overall energy change that occurs when a solution forms is called the heat of solution.

_____ **15.** Solubility is a measure of the minimum amount of solute that dissolves in a given amount of solvent at a specified temperature and pressure.

_____ **16.** Solvation continues as long as the solvation rate is less than the crystallization rate.

_____ **17.** In a saturated solution, solvation and crystallization are in equilibrium.

_____ **18.** Additional solute can be dissolved in an unsaturated solution.

_____ **19.** The solubility of a gas dissolved in a liquid decreases as the temperature of the solution increases.