Chapter 8 Practice Problem Key

**8.31 A** shows KI dissolved in water, since the K+ and I– ions are separated when KI is dissolved. The solution contains ions, so it conducts an electric current. **B** shows KI as a molecule, without being separated into ions, a situation that does not occur.

**8.41** Water-soluble compounds are ionic or are small polar molecules that can hydrogen bond with the water solvent, but nonpolar compounds, such as oil, are soluble in nonpolar solvents.

**8.46** a. KCl and CCl4 do not form a solution.

 b. 1-Propanol (C3H8O) and H2O do form a solution.

 c. Cyclodecanone (C10H18O) and H2O do not form a solution.

 d. Pentane (C5H12) and hexane (C6H14) do form a solution.

**8.59** Use the formula in Example 8.2 to solve the problems.

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**8.65**

a. Add 12 g of acetic acid to the flask and then water to bring the volume to 250 mL.



b. Add 55 mL of ethyl acetate to the flask and then water to bring the volume to 250 mL.



c. Add 37 g of NaCl to the flask and then water to bring the volume to 250 mL.

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**8.71** Calculate the number of milliliters of ethanol in the bottle of wine.



**8.77** When solution **X** is diluted, the volume will increase, but the amount of solute will stay the same (**B**).

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**8.79**

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**8.97** Determine the number of “particles” contained in the solute. If necessary, use 1.86 oC/mol as a conversion factor to relate the temperature change to the number of moles of solute particles.

a. A 0.10 M glucose solution has a higher melting point than 0.10 M NaOH even though the solutions have the same molar concentration, because the NaOH solution contains twice as many particles. Therefore the NaOH solution will have its melting point reduced by twice as much as the glucose solution.

b. A 0.20 M NaCl solution has a higher melting point than a 0.15 M CaCl2 solution.



c. A 0.10 M Na2SO4 solution has a higher melting point than 0.10 M Na3PO4 even though the solutions have the same molar concentration, because the Na2SO4 solution contains fewer particles (three vs. four).

d. A 0.10 M glucose solution has a higher melting point than a 0.20 M glucose solution since it has a lower molar concentration, which causes less melting point depression.

**8.111** Convert ounces to milliliters, and then calculate the weight/volume percent concentration.

