

Chemistry 12  
 Tutorial 7 - SOLUTIONS  
 Ionic and Molecular Solutions

## Self-Test on Tutorial 7

**Do this test right on this sheet. Check the answers on page 1 of Tutorial 7 - Solutions.**

1. Decide whether each of the following compounds will form an Ionic (I) solution or a Molecular (M) solution in water. Assume that all substances dissolve at least partially.
  - a) NiCl<sub>2</sub> ..... **Ionic (salt)**
  - b) CH<sub>3</sub>OH ..... **Molecular (alcohol)**
  - c) CH<sub>3</sub>CH<sub>2</sub>COOH ..... **Partially Ionic (carboxylic acid)**
  - d) Fe(NO<sub>3</sub>)<sub>3</sub> ..... **Ionic (salt)**
  - e) K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> ..... **Ionic (salt)**
  - f) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> ..... **Molecular (a sugar)**
  - g) PCl<sub>3</sub> ..... **Molecular (two non-metals)**
  - h) CsBr ..... **Ionic (salt)**
  - i) HNO<sub>3</sub> ..... **Ionic (acid)**
  - j) HCOOH ..... **Partially Ionic (carboxylic acid)**
2. Write an equation showing what happens when each of the following are dissolved in water: ("a" and "b" are done as an examples)
  - a) Na<sub>2</sub>SO<sub>4(s)</sub>; (ionic)     **Na<sub>2</sub>SO<sub>4(s)</sub> → 2Na<sup>+</sup><sub>(aq)</sub> + SO<sub>4</sub><sup>2-</sup><sub>(aq)</sub>**
  - b) CH<sub>3</sub>OH<sub>(l)</sub>; (molecular)     **CH<sub>3</sub>OH<sub>(l)</sub> → CH<sub>3</sub>OH<sub>(aq)</sub>**
  - c) KCl<sub>(s)</sub>; (ionic)     **KCl<sub>(s)</sub> → K<sup>+</sup><sub>(aq)</sub> + Cl<sup>-</sup><sub>(aq)</sub>**
  - d) NH<sub>4</sub>NO<sub>3(s)</sub>; (ionic)     **NH<sub>4</sub>NO<sub>3(s)</sub> → NH<sub>4</sub><sup>+</sup><sub>(aq)</sub> + NO<sub>3</sub><sup>-</sup><sub>(aq)</sub>**
  - e) Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2(s)</sub>; (ionic)     **Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2(s)</sub> → 3Ca<sup>2+</sup><sub>(aq)</sub> + 2PO<sub>4</sub><sup>3-</sup><sub>(aq)</sub>**



3. When ionic solutions are formed, the material dissolving breaks up into **ions**.

**These are free to move around and therefore will conduct an electrical current.**  
**They are electrolytes.**

4. When molecular solutions are formed, the material dissolving does what?

**The molecules do not break up. They simply mix with water molecules.**

**The End of Tutorial 7 Self-Test**