**Skill 24.01 Problem 1**

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| Which of the following compounds contain covalent bonds?  KMnO4, NaCN, MnI, CO2 |
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**Skill 24.01 Problem 2**

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| Which of the following compounds contain ionic bonds?  MgO, CaH2, CH3COOH, NaClO4, HCl |
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**Skill 24.01 Problem 3**

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| Which of the following pairs of elements or ions is very likely to form an ionic bond? Explain.  (a) MnO4, K (b) Na, F (c) H, CN (d) Na, K (e) C, O |
| Which of the following pairs of elements is very likely to form a covalent bond? Explain.  (a) Mg, F (b) Na, F (c) Ca, Br (d) C, Cl (e) C, Al |

**Skill 24.02 Problem 1**

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| Classify each of the following compounds as ionic or covalent   1. AB is soluble in water and conducts electricity in its molten state 2. XY is insoluble in water and is a gas at room temperature 3. CD is soluble in water and is a liquid at room temperature |
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**Skill 24.02 Problem 2**

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| Element **Z** is found to have these characteristics:   * + - solid     - conducting     - forms the compound **ZCl** with chlorine   **Z** is most likely from which group on the periodic table |
| Element **Z** is found to have these characteristics:   * + - solid     - semiconducting     - forms the compound **ZaOb** with oxygen   **Z** is most likely from which group on the periodic table |