Elements and Bonding Worksheet

1) Classify each of the following elements as an alkali metal, an alkaline-earth metal, transition metal, metalloid, halogen, or noble gas based on its position in the periodic table:

- boron _____
- gold _____
- krypton _____
- calcium _____

2) How many valence electrons do each of the following elements have?

- carbon _____
- selenium _____
- xenon _____
- potassium _____

3) Which of the following ions are likely to be formed?

- N^{+5} _____
- He^{+} _____
- F^{-1} _____
- Al^{+2} _____
- P^{-3} _____
- Mg^{+2} _____

4) Explain why oxygen is a fairly reactive element while neon is not.

5) Explain why beryllium loses electrons when forming ionic bonds, while sulfur gains electrons.

6) Explain why fluorine and chlorine have similar reactivities (the word "valence" should be somewhere in your answer!)

Properties of Ionic Compounds Worksheet

1) Explain why ionic compounds do not conduct electricity in their crystalline form.

2) Why do metals and nonmetals usually form ionic compounds, whereas two bonded nonmetals are never ionic? Explain.

3) Why is the formation of ionic compounds exothermic?

4) Why do ionic compounds tend to be hard?

5) Describe whether the following compounds are likely to be ionic or not ionic based on the properties given. Explain your reasoning.
   - Compound 1 has a melting point of 545 degrees Celsius and dissolves well in water.

   - Compound 2 is a brittle material that is used to melt road ice during storms.

   - Compound 3 melts at 85 degrees Celsius and catches fire when heated to 570 degrees Celsius.