**Ionic and Covalent Bonds**

Essential Question: How is ionic bonding different from covalent bonding?

# Properties of Covalent Compounds

* Form molecules - Gases, liquids, or solids
* Atoms share localised electrons to form bonds.
* Between non-metals.
* Low melting and boiling points (unless large)
* Poor electrical conductors in all phases
* Many soluble in non-polar liquids but not in water

# Properties of Ionic Compounds

* Crystalline solids (made of ions)
* Electron transfer from metal atom to non-metal atom.
* Between metals and non-metals.
* High melting and boiling points
* Conduct electricity when melted
* Many soluble in water but not in non-polar liquid

**Clarifying Questions:**

1. **Why do solid covalent compounds (molecules) have low melting points?**

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1. **Why do ionic compounds have high melting points?**

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1. **How does the bonding in carbon tetrachloride and sodium chloride different from each other?**

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**Instructions:** Classify the following properties as either Ionic or Covalent compounds.

\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. Atoms share electrons to become stable.

\_\_\_\_\_\_\_\_\_\_\_\_\_ 5. High melting and boiling points

\_\_\_\_\_\_\_\_\_\_\_\_\_ 6. Conduct electricity when melted

\_\_\_\_\_\_\_\_\_\_\_\_\_ 7. Usually occurs between non-metals.

\_\_\_\_\_\_\_\_\_\_\_\_\_ 8. Poor electrical conductors in all phases

\_\_\_\_\_\_\_\_\_\_\_\_\_ 9. Many soluble in non-polar liquids but not in water

\_\_\_\_\_\_\_\_\_\_\_\_\_10. Crystalline solids (made of ions)

\_\_\_\_\_\_\_\_\_\_\_\_\_11. Metal atoms give electrons while non-metal atoms get electrons to become stable

\_\_\_\_\_\_\_\_\_\_\_\_\_12. Usually occurs between metals and non-metals.

\_\_\_\_\_\_\_\_\_\_\_\_\_13. Hydrogen and another non-metal chemically combines through covalent bonding.

\_\_\_\_\_\_\_\_\_\_\_\_\_14. Low melting and boiling points

\_\_\_\_\_\_\_\_\_\_\_\_\_15. Many soluble in water but not in non-polar liquid

**Classify the following as metal or non-metal and ionic or covalent compounds.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Compound**  | **First element/atom (metal or non –metal )**  | **Second element/atom (metal or non –metal )**  | **Ionic or Covalent**  |
| **CH4**  | C is a non metal  | H is non-metallic.  | covalent  |
| **MgCl2**  |  |  |  |
| **H2O**  |  |  |  |
| **CCl4** |  |  |  |
| **HF**  | H in this case is metallic |  |  |
|  **HCl**  |  |  |  |
|  **NaCl**  |  |  |  |
|  **Mg3P**  |  |  |  |

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