



Ionic and Covalent Compounds

Name: _____ **KEY**

1. We differentiate between two types of compounds: _____ **IONIC** and _____ **COVALENT**.
2. Ammonia, NH_3 is a _____ **COMPOUND** _____ while nitrogen and hydrogen are _____ **ELEMENTS** _____.
3. In general, molecular compounds form when _____ **NONMETALS** _____ combine together.
4. In general, ionic compounds form when _____ **METALS & NONMETALS** _____ combine together.
5. Sucrose (table sugar), $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ is _____ **MOLECULAR or COVALENT** compound, while sodium chloride (table salt) is _____ **an IONIC** compound.
6. Carbon monoxide, CO , is an example of a diatomic molecule, while ammonia and glucose, NH_3 and $\text{C}_6\text{H}_{12}\text{O}_6$, are examples of **POLYATOMIC** molecules.
7. Ionic compounds are composed of positively and negatively charge ions held together by strong _____ **ELECTROSTATIC** attraction.
8. A positively charged ion such as Ca^{2+} is called _____ **CATION** and it is formed when an atom of calcium **LOSES 2 electrons** _____. The _____ **cation** will have as many electrons as the noble gas _____ **ARGON**.
9. A negatively charged ion such as Cl^- is called _____ **an ANION** and it is formed when an atom of chlorine _____ **GAINS 1 electron**. When it does, the ion will have as many electrons as _____ **ARGON**.
10. The most stable ion of nitrogen is _____ **N^{3-}** _____. This ion has the same number of electrons (electronic configuration) as _____ **NEON**.
11. The most stable ion that aluminum forms is _____ **Al^{3+}** This ion has the same electronic configuration as _____ **NEON**.
12. While K^+ and Ba^{2+} are monoatomic ions, NH_4^+ and PO_4^{3-} are _____ **POLYATOMIC** ions.
13. Ionic compounds exist as crystal lattice, which is a network of anions and cations held together by electrostatic forces. We use the term _____ **FORMULA UNIT** to describe the smallest whole number ratio of ions in the crystal lattice.



Classify the following compounds as IONIC (metal + nonmetal), COVALENT (nonmetal + nonmetal) or BOTH (compound containing a polyatomic ion).

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| 1. CaCl_2 | IONIC | 11. MgO | IONIC |
| 2. CO_2 | COVALENT | 12. NH_4Cl | BOTH |
| 3. H_2O | COVALENT | 13. HCl | COVALENT |
| 4. BaSO_4 | BOTH | 14. KI | IONIC |
| 5. K_2O | IONIC | 15. NaOH | BOTH |
| 6. NaF | IONIC | 16. NO_2 | COVALENT |
| 7. Na_2CO_3 | BOTH | 17. AlPO_4 | BOTH |
| 8. CH_4 | COVALENT | 18. FeCl_3 | IONIC |
| 9. SO_3 | COVALENT | 19. P_2O_5 | COVALENT |
| 10. LiBr | IONIC | 20. N_2O_3 | COVALENT |