

Compare/ Contrast Ionic and Covalent Bonding

	Ionic	Covalent	Similar or Different
substance formed as a result of bond			
individual particle called			
definition			
formed from what type of atoms			
why do bonds form			
what happens to electrons when bonding occurs show an example using Lewis structures			

	Ionic	Covalent	Similar or Different
how are bonds held together			
strength of bond			
interparticle/ intermolecular attraction			
hardness			
melting point			
boiling point			
how to write formulas and names			
examples			
relationship to acids			

Ionic Bonding and Covalent Bonding: Compare & Contrast

	Ionic Bonding	Covalent Bonding	Similar or Different
what is formed as a result of bond	ionic compounds/formula units	molecules/molecular compounds	
definition	electrostatic force that holds oppositely charged particles together in an ionic compound	chemical bond that results from the sharing of valence electrons	
formed from what type of atoms	metallic cation and a non-metallic anion	generally formed between two non-metallic elements	
what happens to electrons	Electrons are transferred from one neutral atom to another causing one to become positive and the other to become negative. Metals lose electrons to become positive, while nonmetals gain electrons to become negative.	Two atoms that need to fill their outer energy level share electrons in order to fill both of their outer shells simultaneously.	
how are bonds held together	The oppositely charged ions are attracted to each other.	balance of attractive and repulsive forces of the protons and electrons; attraction of the nucleus of one atom for the valence electrons of another	
strength of bond	very strong	very strong	
interparticle/intermolecular attraction	very strong	van der Waals forces, not as strong as in ionic compounds	
hardness	hard, brittle	soft compared to ionic compounds, not brittle	
melting point	high – due to strong bonds	low – due to weaker intermolecular forces	

	Ionic Bonding	Covalent Bonding	Similar or Different
boiling point	high – due to strong bonds	low – due to weaker intermolecular forces	
how to write formula	<ol style="list-style-type: none"> 1. determine charge (oxidation number) 2. write cation first, anion second 3. use element name for the cation 4. for the anion, use the root of their element name with the suffix –ide 5. if the cation has more than one charge, use the appropriate Roman numeral in parentheses to indicate the charge 	<ol style="list-style-type: none"> 1. first element in the formula is named first 2. second element in the formula is named next using the root of the element name and adding the suffix –ide 3. use prefixes to indicate the number of atoms of each type that are present in the compound 	
why do bonds form	To gain the stable, full, outer energy level of eight valence electrons (2 for hydrogen and helium). This results in a noble gas electron configuration.	To gain the stable, full, outer energy level of eight valence electrons (2 for hydrogen and helium). This results in a noble gas electron configuration.	
examples	salt, minerals, crystals, baking powder, calcium bromide	carbohydrates, simple sugars, proteins, fats, DNA, wool, cotton, synthetic fibers, fertilizer, paraffin	
relationship to acids	acids produce ions in aqueous solution binary compounds with H as cation that are not dissolved in water are named like binary ionic compounds	acids are formed by covalent bonds but are not named like covalent molecules; naming rules for binary and tertiary acids must be followed	