

Vocabulary Bonding

1	anion	An anion is a negatively charged ion. Nonmetals typically form anions.
2	bond energy	Energy change per mole when a bond is broken in the gas phase for a particular substance.
3	cation	A cation is a positively charged ion. Metals typically form cations.
4	chemical bond	A chemical bond is a strong attraction between two or more atoms. Bonds hold atoms in molecules and crystals together. There are many types of chemical bonds, but all involve electrons which are either shared or transferred between the bonded atoms.
5	covalent bonding	A compound made of molecules- not ions. The atoms in the compound are bound together by shared electrons. Also called a molecular compound.
6	dipole	An object whose centers of positive and negative charge do not coincide. For example, a hydrogen chloride (HCl) molecule is an electric dipole because bonding electrons are on average closer to the chlorine atom than the hydrogen, producing a partial positive charge on the H end and a partial negative charge on the Cl end. Also called an Electric Dipole.
7	double bond	A bond in which two pairs of electrons are shared between two atoms.
8	ductile	Capable of being drawn into wire. Metals are typically ductile materials.
9	electron-dot notation	See Lewis Structure
10	electrostatic	Of or relating to electric charges at rest. Produced or caused by such charges.
11	formula unit	One formula weight of a compound.
12	hydrogen bonding	An especially strong dipole-dipole force between molecules X-H...Y, where X and Y are small electronegative atoms (usually F, N, or O). Hydrogen bonds are responsible for the unique properties of water and they loosely pin biological polymers like proteins and DNA into their characteristic shapes.
13	intermolecular forces	An attraction or repulsion between molecules. Intermolecular forces are much weaker than chemical bonds. Hydrogen bonds, dipole-dipole interactions, and London forces are examples of intermolecular forces.
14	ionic bonding	An attraction between ions of opposite charge. Potassium bromide consists of potassium ions (K^+) ionically bound to bromide ions (Br^-). Unlike covalent bonds, ionic bond formation involves transfer of electrons, and ionic bonding is not directional.
15	ionic compounds	Also called a salt. A compound made of distinguishable cations and anions, held together by electrostatic forces.
16	Lewis structures	A model pioneered by Gilbert N. Lewis and Irving Langmuir that represents the electronic structure of a molecule by writing the valence electrons of atoms as dots. Pairs of dots (or lines) wedged between atoms represent bonds; dots drawn elsewhere represent nonbonding electrons.
17	liquids	The state of matter in which a substance exhibits a characteristic readiness to flow, little or no tendency to disperse, and relatively high incompressibility. Matter or a specific body of matter in this state.
18	localized electron	Electrons that stay close to the atom
19	London Forces	Also called London dispersion forces (see - Van der Waals forces)
20	malleability	Capable of being hammered into sheets. Metals are typically malleable materials.
21	melting point	Point where a solid becomes a liquid
22	metallic bonding	Metallic bonding is the electrostatic attraction between the positively charged ions and negatively charged electrons
23	molecular compounds	Molecules consist of two or more atoms bonded to one another through "covalent" bonds.

24	molecular formula	Also called a chemical formula. A notation that indicates the type and number of atoms in a molecule. The molecular formula of glucose is $C_6H_{12}O_6$, which indicates that a molecule of glucose contains 6 atoms of carbon, 12 atoms of hydrogen, and 6 atoms of oxygen.
25	molecular geometry	1. The three-dimensional shape of a molecule. For example, methane (CH_4) has a tetrahedral molecular geometry. 2. The study of molecular shapes.
26	molecule	The smallest particle of an element or compound that retains the chemical properties of the element or compound. A molecule is a collection of chemically bound atoms with characteristic composition and structure. Ionic compounds are not composed of molecules, because there is no distinct collection of ions chemically bound in the crystal.
27	multiple bonds	Sharing of more than one electron pair between bonded atoms. A double bond consists of two shared pairs of electrons; a triple bond consists of three shared pairs.
28	non-localized electrons	Electrons that are not bound to a particular atom.
29	nonpolar covalent bond	Bond in which electrons are shared between elements having a difference in electronegativity of less than 0.5.
30	octet rule	A guideline for building Lewis structures that states that atoms tend to gain, lose, or share valence electrons with other atoms in a molecule until they hold or share eight valence electrons. The octet rule almost always holds for carbon, nitrogen, oxygen, and fluorine; it is regularly violated for other elements.
31	polar-covalent bond	A bond in which electrons are shared between elements having a difference in electronegativity of between 0.5 and ~2.0.
32	polar molecule	An asymmetric molecule containing polar bonds . H_2O, NH_3, and HCl are examples of polar molecules. Non-examples are CO_2, CCl_4, and BCl_3 which contain polar bonds but are nonpolar because they have symmetric shapes. Alkanes are usually asymmetric but are nonpolar because they contain no polar bonds. Polar molecules are electric dipoles and they attract each other via dipole-dipole forces .
33	polar water	Water is a polar molecule
34	polarity	A property associated with molecules when the center of positive charge and the center of negative charge don't coincide. See also polar molecule and polar bond.
35	polyatomic molecule	A polyatomic molecule is an uncharged particle that contains more than two atoms.
36	resonance	Description of the ground state of a molecule with delocalized electrons as an average of several Lewis structures. The actual ground state doesn't switch rapidly between the separate structures: it is an average.
37	salt crystals	A crystal is a solid mineral body. It has a definite shape and volume and the atoms are arranged in fixed, regularly repeating patterns.
38	structural formula	A structural formula is a diagram that shows how the atoms in a molecule are bonded together. Atoms are represented by their element symbols and covalent bonds are represented by lines. The symbol for carbon is often not drawn. Most structural formulas don't show the actual shape of the molecule (they're like floor plans that show the layout but not the 3D shape of a house).
39	tetrahedral	A descriptor of the geometry of a molecule in which a central atom forms four bonds which are directed toward the corners of a regular tetrahedron.
40	triple bond	A covalent bond that involves 3 bonding pairs. In the valence bond theory, one of the bonds in a triple bond is a sigma bond and the other two are pi bonds. For example, the central bond in acetylene is a triple bond: $H-C\equiv C-H$.
41	valence bond	In the valence bond theory , a valence bond is a chemical bond formed by overlap of half-filled atomic orbitals on two different atoms.
42	valence electron	Electrons that can be actively involved in chemical change; usually electrons in the shell with the highest value of n. For example, sodium's ground state electron configuration is $1s^2 2s^2 2p^6 3s^1$; the 3s electron is the only valence electron in the atom. Germanium (Ge) has the ground state electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^2$; the 4s and 4p electrons are the valence electrons.
43	Van der Waals forces	A force acting between nonbonded atoms or molecules. Includes dipole-dipole, dipole-induced dipole, and London forces.
44	VSEPR theory	Valence Shell Electron Pair Repulsion (VSEPR) model