


UNIT 1: Atomic Structure and Properties

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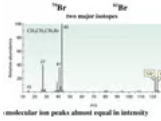




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Terms in this set (29)

Avagadro's Number	Provides a connection between the number of moles in a pure sample of a substance and the number of particles or formula units of that substance	 $N_A = 6.02 \times 10^{23}$
Mass Spectroscopy	Can be used to determine the identity of isotopes of the element, relative abundance of each isotope in nature, and/or average atomic mass.	 <small>two major isotopes</small> <small>molecular ion peaks almost equal in intensity</small>
Empirical Formula	Chemical formula that lists the lowest whole number ratio of atoms of the elements in a compound	
Molecular Formula	A chemical formula that shows the number and kinds of atoms in a molecule, but not the arrangement of the atoms.	
Law of Definite Proportions	The ratio of the masses of the elements in any pure sample is always the same.	
Pure Substance	A sample of matter, either a single element or a single compound, that has definite chemical and physical properties	
Mixture	A combination of two or more substances that are not chemically combined	
Homogeneous	Of the same kind	
Heterogeneous	different; dissimilar	

UNIT 1: Atomic Structure and Properties

Aufbau Principle	An electron occupies the lowest-energy orbital that can receive it	
Pauli Exclusion Principle	An atomic orbital may describe at most two electrons, each with opposite spin direction	
Hund's Rule	Electrons occupy orbitals of the same energy in a way that makes the number of electrons with the same spin direction as large as possible	
Degenerate Orbitals	Orbitals that have the same energy	
Coulomb's Law	Force between charged objects depends on the distance between the objects and the magnitude of the charges.	$= k \frac{q_1}{r}$
Energy Levels	Also known as shells, the possible energies that electrons in an atom can have (n=1 to n=7)	
Subshell	s, p, d, f	
Orbital	most probable region where an electron is located. Located within subshells	
Core Electrons	The electrons in the inner shells of an atom; these electrons are not involved in forming bonds.	
Valence Electrons	Electrons on the outermost energy level of an atom; bonding electrons	
Cation	A positively charged ion; usually a metal	
Anion	A negatively charged ion; usually a non-metal	
Photoelectron Spectroscopy (PES)	Measures the energies of the electrons in a given shell. The position of the peak is related to the energy required to remove an electron from the subshell, and the height is proportional to the number of electrons in the subshell.	
Effective Nuclear Charge	Also known as Z _{eff} The actual nuclear charge experienced by an electron, defined as the charge of the nucleus plus the charge of the shielding electrons	
Shielding	The effect on an electron of repulsion by electrons in lower-energy orbitals that screen it from the full effects of nuclear charge	
Ionization Energy	The amount of energy required to remove an electron from an atom	
Atomic Radii	Half the distance between the nuclei of identical atoms that are bonded together	
Ionic Radii	measured distance from the center of an ion to its outer electrons	
Electron Affinity	The energy change associated with the addition of an electron to a gaseous atom	
Electronegativity	A measure of the ability of an atom in a chemical compound to attract electrons	