

DEFINITIONS

TOPIC I-CHEMISTRY REVIEW

Activity - the “effective concentration” of an ion in the presence of an electrolyte.

Activity coefficient - empirically derived value accounting for the non-ideal behavior of solutes at different ionic strengths.

Arrhenius Theory- acid ionizes in H_2O to give H^+ , base ionizes to give OH^- .

Atomic number - The number of protons in the nucleus of an atom of the element.

Atomic weight - The mass of an atom of an element relative to that of a carbon atom.

Aufbau principle - In building up the electronic configuration of an atom, electrons are added first to orbitals in the sublevels of lowest energy.

Bronsted Theory - acid can donate a proton and a base can accept a proton.

Chemical bonding - A union of two atoms, ions, or molecules due to some redistribution, regrouping, or reorientation of their electrons to form a more stable arrangement.

Common Ion effect - decreased solubility of a solid due to the addition of an electrolyte solution with an ion found in the solid.

Complex ion - A more or less stable, charged aggregate formed when an atom or ion most commonly from a metal, becomes directly attached to a group of neutral molecules and/or ions. The latter are called ligands or donor groups and they are said to be coordinated or complexed to the central ion or acceptor.

Coordinate-covalent bond - A chemical bond in which both electrons of the bond are supplied by the same (donor) atom, and the other atom (acceptor) provides an orbital for accommodating these electrons.

Coordination number - Is the number of ligand atoms arranged in definite geometry and directly bonded to a central ion.

Covalent bond - A chemical bond formed by sharing a pair of electrons, each atom has contributed one of the shared electrons.

Diverse Ion Effect - increased solubility of a solid due to the addition of an electrolyte solution with an ion not found in the solid (reduction in activity).

Electronegativity - The relative attraction of atoms for the valence electrons in a covalent bond.

Hydration - the ordered arrangement of water molecules around solute particles.

Hydrolysis - a chemical reaction involving the splitting of a water molecule. Hydration taken to the extreme.

Hydrogen bond - A chemical bond between two electronegative atoms, holding one by a covalent bond and one by purely electrostatic forces.

Ion Pair - (outer-sphere complex) involving electrostatic interacting metals and ligands where waters of hydration are retained. Shorter range interactions.

Ion Complex - (inner-sphere complex) stable entities found in solution that are formed largely via covalent metal-ligand bonds. Some waters of hydration are removed.

Ionic bond - A chemical bond formed by an electrostatic attraction between oppositely charged ions.

Ionization Energy - the energy required to remove an electron from an atom or ion in the gas phase.

Lewis Theory - acid is an electron pair acceptor and a base is an electron pair donor.

Ligand - The electron donor atom, ion or group in a complex.

Mass - A measure of the resistance of an object to change in its state of rest or motion.

Mole - Is the amount of pure substance that contains as many particles (atoms, molecules, or other fundamental units) as there are atoms in exactly 12 grams of the carbon - 12 isotope (Chemists 6-pack).

Molarity - simply the moles of a substance in 1 liter of solution

Orbital - The region in space where an electron is likely to be found.

Van der Waals Forces - weak interactions between molecules or between different portions of molecules.