

Glossary

Chapter 17—Elements and the Periodic Table

alchemy (p. 410) An ancient study of chemistry that also included philosophy, religion, observational science, art, mysticism, and ritual and was often associated with occult practices and efforts to change base materials into gold or discover elixirs of youth.

chemical symbol (p. 413) A unique symbol used to represent an element, consisting of one or two letters derived from the element's current or Latin name.

monatomic (p. 414) Describing an element that naturally occurs as a single atom or any particle consisting of a single atom.

diatomic (p. 414) Describing an element that naturally occurs as two identical, bonded atoms or any particle consisting of two atoms.

periodic table of the elements (p. 415) A table of the chemical elements that is arranged to display their periodic properties in relation to their atomic numbers. References are usually to the Mendeleev/Moseley form of the periodic table, although other formats exist.

periodic law of the elements (p. 420) The principle that the properties of the elements vary with their atomic numbers in a periodic way.

metal (p. 422) An element that is typically dense, solid, ductile, malleable, highly conductive, and chemically active, especially in the presence of nonmetal elements. Metals have few valence electrons and comprise almost three-fourths of all elements.

luster (p. 422) A property that describes the quality of light reflected by a substance by referring to common materials having similar reflective properties. A material's luster may be metallic, pearly, glassy, etc.

malleable (p. 422) Able to be easily deformed by hammering or cold rolling.

ductile (p. 422) Able to be easily drawn into wire or otherwise deformed by stretching.

nonmetal (p. 422) An element that typically has four or more valence electrons and does not exhibit the properties of metals. Nonmetals can be a gas, liquid, or dull, brittle solid at room temperature. They are generally poor conductors, and their chemical activity is highly variable, from very reactive to inert.

metalloid (p. 423) An element that is neither a metal nor a nonmetal but can display some characteristics of either under certain conditions.

semimetal (p. 423) See *metalloid*.

family (p. 423) A group of elements having the same valence electron structure and often similar chemical properties; elements residing in a column on the periodic table. Families are named by the element at the top of the column. See also *group*.

group (p. 423) A column of elements on the periodic table, identified by a group number and *A* or *B* or just a number in the IUPAC form of the periodic table. See also *family*.

alkali metal (p. 424) An element in Group 1A of the periodic table; a strongly reactive metal with an oxidation number of +1.

alkaline-earth metal (p. 424) An element in Group 2A of the periodic table; a very reactive metal having an oxidation number of +2.

alloy (p. 424) A mixture of metals that can be heterogeneous or homogeneous.

transition element (p. 424) Any of the metallic elements in the middle of the periodic table in the B subgroups.

carbon family (p. 425) Group 4A of the periodic table; elements of variable activity typically with an oxidation number of ± 4 .

nitrogen family (p. 426) Group 5A of the periodic table; a highly variable group of elements, several of which have as many as eight different oxidation numbers.

oxygen family (p. 426) Group 6A of the periodic table. Most elements in this family have an oxidation number of -2 .

halogen family (p. 426) An element in Group 7A of the periodic table; a very reactive element typically with an oxidation number of -1 .

noble gas (p. 427) An element in Group 8A of the periodic table; an essentially inert, monatomic gas with an oxidation number of 0.

inner transition element (p. 427) Any member of the two rows of metallic elements normally placed below the periodic table, which typically have an oxidation number of +2.

period (p. 427) A horizontal row in the periodic table of the elements. Also called a series.

series (p. 427) See *period*.

electron dot notation (p. 431) A chemical symbol representing the valence electrons of an atom.