Etymology

The word *chemistry* comes from a modification during the Renaissance of the word *alchemy*, which referred to an earlier set of practices that encompassed elements of chemistry, metallurgy, philosophy, astrology, astronomy, mysticism, and medicine. Alchemy is often associated with the quest to turn lead or other base metals into gold, though alchemists were also interested in many of the questions of modern chemistry.[1]

The modern word *alchemy* in turn is derived from the Arabic word *al-kīmīā* ( ). This may have Egyptian origins since *al-kīmīā* is derived from the Ancient Greek χημία, which is in turn derived from the word *Kemet*, which is the ancient name of Egypt in the Egyptian language.[2] Alternately, *al-kīmīā* may derive from χημεία 'cast together'.[3]

Modern principles


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The current model of atomic structure is the quantum mechanical model.[4] Traditional chemistry starts with the study of elementary particles, atoms, molecules,[5] substances, metals, crystals and other aggregates of matter. Matter can be studied in solid, liquid, gas and plasma states, in isolation or in combination. The interactions,[6] reactions and transformations that are studied in chemistry are usually the result of interactions between atoms, leading to rearrangements of the chemical bonds which hold atoms together. Such behaviors are studied in a chemistry laboratory.

The chemistry laboratory stereotypically uses various forms of laboratory glassware. However glassware is not central to chemistry, and a great deal of experimental (as well as applied/industrial) chemistry is done without it.

Solutions of substances in reagent bottles, including ammonium hydroxide and nitric acid, illuminated in different colors

A chemical reaction is a transformation of some substances into one or more different substances.[] The basis of such a chemical transformation is the rearrangement of electrons in the chemical bonds between atoms. It can be symbolically depicted through a chemical equation, which usually involves atoms as subjects. The number of atoms on the left and the right in the equation for a chemical transformation is equal. (When the number of atoms on either side is unequal, the transformation is referred to as a nuclear reaction or radioactive decay.) The type of chemical reactions a substance may undergo and the energy changes that may accompany it are constrained by certain basic rules, known as chemical laws.

Energy and entropy considerations are invariably important in almost all chemical studies. Chemical substances are classified in terms of their structure, phase, as well as their chemical compositions. They can be analyzed using the tools of chemical analysis, e.g. spectroscopy and chromatography. Scientists engaged in chemical research are known as chemists.[] Most chemists specialize in one or more sub-disciplines. Several concepts are essential for the study of chemistry; some of them are