

Symbols, Chemical Encyclopedia Article

Symbols, Chemical

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Symbols, Chemical

The earliest chemical symbols were devised by alchemists, who often used and adapted the rich symbolism of astrology. For example, in Etienne Geoffroy's (1672-1731) table of chemical affinities, published in 1718, the astrological symbol for Mars is used to indicate iron (the symbol for the sun, a circle with a dot in the center, is used for gold). The symbolism is not accidental: the importance of the sun in astrology clearly parallels the exalted position of gold in alchemy. Geometrical figures, such as triangles, and circled letters were also used, N for nickel, M for manganese, etc.

John Dalton (1866-1844), famous for his atomic theory, also used circles surrounding capital letters: I for iron, Z for zinc, C for copper, L for Lead, S for silver, and P for platinum.

It was J. J. Berzelius (1779-1848), who, in 1811, introduced our familiar one- or two-letter symbols for the chemical elements, with subscripts indicating how they are combined in compounds. One atom of an element is represented by a one- or two-letter symbol. Elements that were known first, or were most common, were given the one-letter symbol. Subsequent elements beginning with the same first letter were given symbols that might bring the name to mind: C is carbon, Cl is chlorine, and Cf is californium. The first letter is always capitalized, and the second is in lower case. This is very important; we do not want to confuse CO, the deadly gas carbon monoxide, with Co, the metallic element cobalt.

Subscripts following the symbol for each atom are used to indicate how many are present in a compound. For example, a molecule of table sugar consists of 12 carbon atoms, 22 hydrogen atoms, and 11 oxygen atoms. The formula is $C_{12}H_{22}O_{11}$.