

## main points

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- The development of chemistry was first stimulated by the establishment of organized and stable villages.
- Ancient alchemy, focused on the desire to produce gold, was a reasonable endeavor, given the understanding of the times. It led to a greatly improved knowledge of the behavior of matter.
- Tremendous advances in chemical understanding took place from the late 18th century onward, beginning with the identification of the gases in air.
- Dalton's Atomic Theory made significant strides toward an appreciation of the nature of matter. It focused attention on the key fact that atoms combine in specific fixed proportions to form compounds.
- Chemical formulas list the elements present in a compound and the proportions in which they are present.
- The periodic table lists the elements in order of atomic number. Its structure is based on periodic relationships between the chemical properties of different elements, which are due to their electron configuration.
- The atoms of the noble gases (Group 8A) have very stable electron arrangements. Apart from helium, all of the noble gases have a stable octet of outer electrons. Helium has a completely full first (and only) electron shell.
- When atoms of elements react together to form compounds, the products of those reactions tend to have electron configurations similar to those of the inert gases.