

Dalton's Atomic Theory

Democritus first suggested the existence of the atom but it took almost two millennia before the atom was placed on a solid foothold as a fundamental chemical object by John Dalton (1766-1844). Although two centuries old, Dalton's atomic theory remains valid in modern chemical thought.



John Dalton Biography

John Dalton (1766–1844) was an English chemist with a Quaker background. His religious beliefs, and perhaps his modesty, prevented him from accepting much of his deserved fame and recognition. Today Dalton is known primarily for his atomic theory, although his inquisitive nature and diligent research led him to make many important discoveries in fields other than chemistry. He made a careful study of color-blindness, a condition from which he suffered. Dalton was also a pioneer meteorologist, keeping daily records of the weather for 57 years. His fascination with weather and the atmosphere led to his research into the nature of gases, which in turn became the foundation on which he built his atomic theory.

Dalton's Atomic Theory

1) All matter is made of atoms. Atoms are indivisible and indestructible.

2) All atoms of a given element are identical in mass and properties

3) Compounds are formed by a combination of two or more different kinds of atoms.

4) A chemical reaction is a *rearrangement* of atoms.

Modern atomic theory is, of course, a little more involved than Dalton's theory but the essence of Dalton's theory remains valid. Today we know that atoms can be destroyed via nuclear reactions but not by chemical reactions. Also, there are different kinds of atoms (differing by their masses) within an element that are known as "isotopes", but isotopes of an element have the same chemical properties.

Many heretofore unexplained chemical phenomena were quickly explained by Dalton with his theory. Dalton's theory quickly became the theoretical foundation in chemistry.

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