

Editorial Highlights on Atomic Structure and Bonding

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EDITORIAL

From elementary chemistry it is known that the atomic structure of any element is made up of a positively charged nucleus surrounded by electrons revolving around it. An element's atomic number indicates the number of positively charged protons in the nucleus. The atomic weight of an atom indicates how many protons and neutrons in the nucleus. To determine the number of neutrons in an atom, the atomic number is simply subtracted from the atomic weight.

Atoms like to have a balanced electrical charge. Therefore, they usually have negatively charged electrons surrounding the nucleus in numbers equal to the number of protons. It is also known that electrons are present with different energies and it is convenient to consider these electrons surrounding the nucleus in energy "shells." For example, magnesium, with an atomic number of 12, has two electrons in the inner shell, eight in the second shell and two in the outer shell.

All chemical bonds involve electrons. Atoms will stay close together if they have a shared interest in one or more electrons. Atoms are at

their most stable when they have no partially-filled electron shells. If an atom has only a few electrons in a shell, it will tend to lose them to empty the shell. These elements are metals. When metal atoms bond, a metallic bond occurs. When an atom has a nearly full electron shell, it will try to find electrons from another atom so that it can fill its outer shell. These elements are usually described as nonmetals. The bond between two nonmetal atoms is usually a covalent bond. Where metal and nonmetal atom come together an ionic bond occurs.

Covalent bonds form as valence electrons are shared between two atoms. Lewis Structures and structural formulas are common ways of showing the covalent bonding in organic molecules. ... Atomic orbitals often change as they overlap to form molecular orbitals. This process is known as orbital hybridization.

Chemical bonding depends on an element's electron configuration. - Electrons closer to the nucleus have less energy than those that are farther away from the nucleus. Covalent bonds form when atoms share electrons. Ionic bonds form between positively and negatively charged ions.

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