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Chemical bonds

Matter

• **Chemical bonds** link together atoms to make molecules (see Molecules).

• **Atoms can bond** in three main ways: ionic bonds, covalent bonds, and metallic bonds.

• **In ionic bonds** electrons are transferred between atoms.

• **Ionic bonds** occur when atoms with just a few electrons in their outer shell give the electrons to atoms with just a few missing from their outer shell.

• **An atom** that loses an electron becomes positively charged; an atom that gains an electron becomes negatively charged so the two atoms are drawn together by the electrical attraction of opposites.

• **Sodium** loses an electron and chlorine gains one to form the ionic bond of sodium chloride (table salt) molecules.

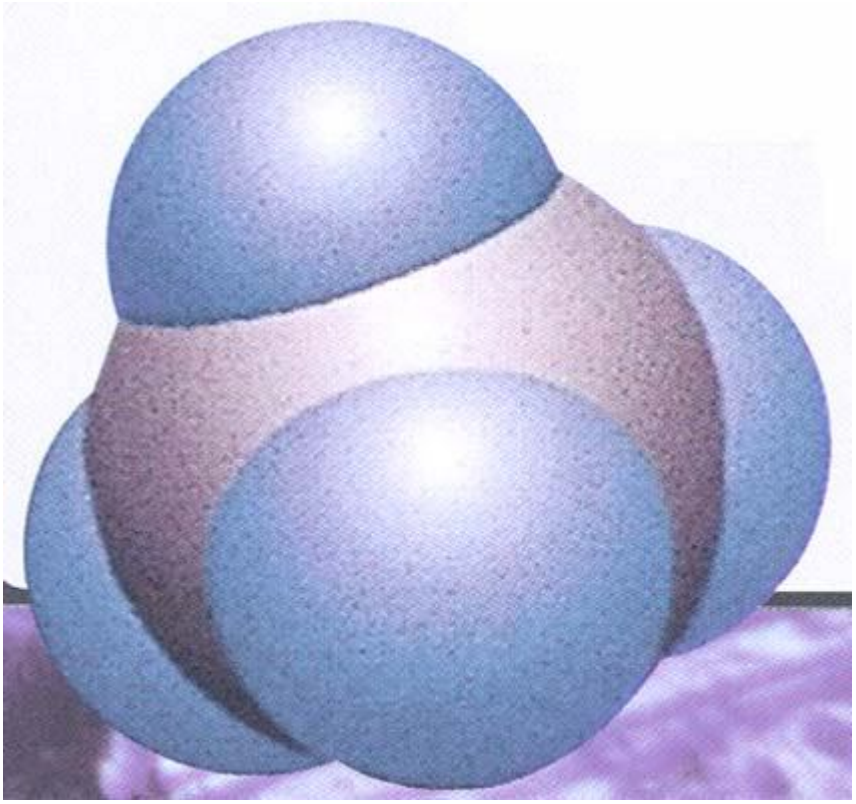
• **In covalent bonding,** the atoms in a molecule share electrons.

• **Because they are negatively** charged, the shared electrons are drawn equally to the positive nucleus of both atoms involved. The atoms are held together by the attraction between each nucleus and the shared electrons.

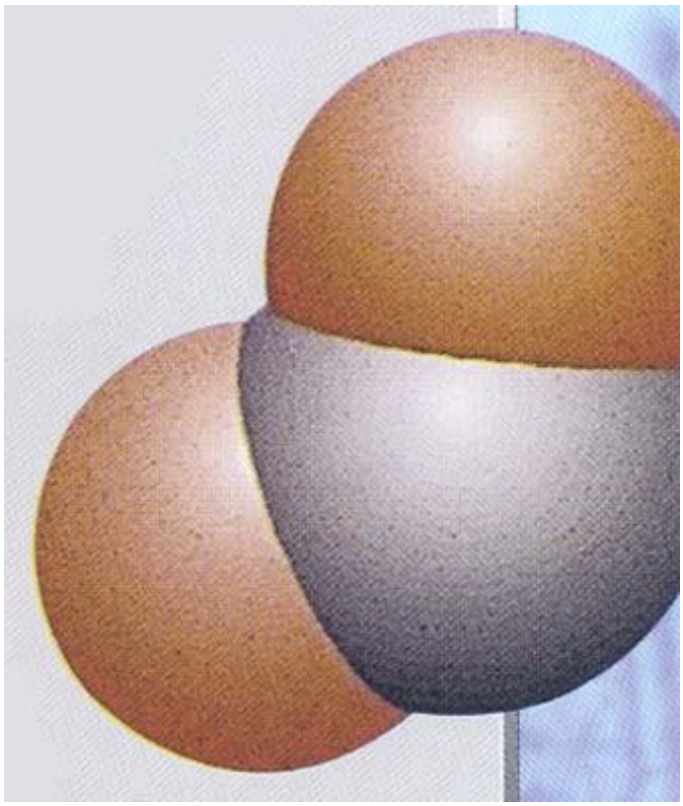
• **In metallic bonds** huge numbers of atoms lose their electrons. They are held together in a lattice by the attraction between "free" electrons and positive nuclei.

STAR FACT

Seven elements, including hydrogen, are found in nature only as two atoms covalently bonded.



Each of the four hydrogen atoms in methane shares its electron with the central carbon atom to create strong covalent bonds.



In this carbon dioxide molecule the carbon is held to two oxygen atoms by covalent bonds.

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By John Farndon
