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Electron Energy and Interaction at the Atomic Level

Muhamadi Kamila*

Department of Applied Sciences, Universitiy Teknologi MARA Shah Alam, Selangor, Malaysia

***Corresponding Author:** Muhamadi Kamila, Department of Applied Sciences, Universitiy Teknologi MARA Shah Alam, Selangor, Malaysia, E-mail: muhamaidkamila1@uitm.edu.my

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Description

The fixed distances from an atom's nucleus where electrons may be found and referred to energy levels also known as electron shells. Higher energy electrons have greater energy move out from the nucleus. Energy levels are nothing more than the electrons' set distances from an atom's. The electron shell is another name energy levels. An electron can migrate across energy levels, but it cannot remain in one energy level while in another. These energy levels overlap, the distance between the highest occupied and lowest unoccupied energy levels changes as atoms group to form clusters or molecules, and electrons are largely dispersed along the bonds that the atoms make.

Energy bands replace energy bonds in crystals where there is a high degree of overlap between the discrete energy levels. The crystals are either semiconducting or insulating when the energy bands show a gap near the Fermi energy, and the bonding can range from weak van der Waals to strong covalent or ionic. However, when electrons are delocalized and the energy gaps at the Fermi level close, metallic bonding occurs. When a quantum mechanical system or particle is bound, or spatially constrained, it can only take on specific discrete energy values, or energy levels. As opposed to classical particles, which can have any energy level, it can also refer to the energy levels of nuclei or the vibrational or rotational energy levels in molecules. The term is most frequently used to describe the energy levels of the electrons in atoms, ions, or molecules that are confined by the electric field of the nucleus. A system with such distinct energy levels is said to have a quantized energy spectrum.

Positive charged particles

A proton and other positive-charged particles are attracted to an electron's electric field, while a particle with a negative charge is attracted to the negative field. The quantity of valence electrons in an atom controls the interactions between atoms. The electrons in the outermost shell are known as valence electrons. An atom needs a full outer shell of valence electrons to be stable and inert. The energy added to the total by an interaction between the objects under consideration is known as interaction energy. The relative positions of the items frequently affect the interaction energy. The energy of electrostatic interaction, for instance, exists between two charged things. The electromagnetic forces of attraction or repulsion that act between atoms and other types of nearby particles, such as atoms or ions, is called Intermolecular Forces (IMFs), also known as secondary forces. There are seven periods in the periodic table, and each period has a certain number of energy levels. Each level corresponds to a different row in the table. For example, Hydrogen (H) is in the first period with one energy level the orbits around atoms to which energy level an electron occupies. That means that electrons can transition between shells or Energy Levels by emitting or absorbing photons of electromagnetic radiation with exactly equal energies. Electrons are not solely a traditional wave or particle, but instead possess both qualities in varying degrees. Though an electron cannot be accurately labeled as either one, it is nonetheless a fluctuating probability wave function that possesses aspects of both.

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