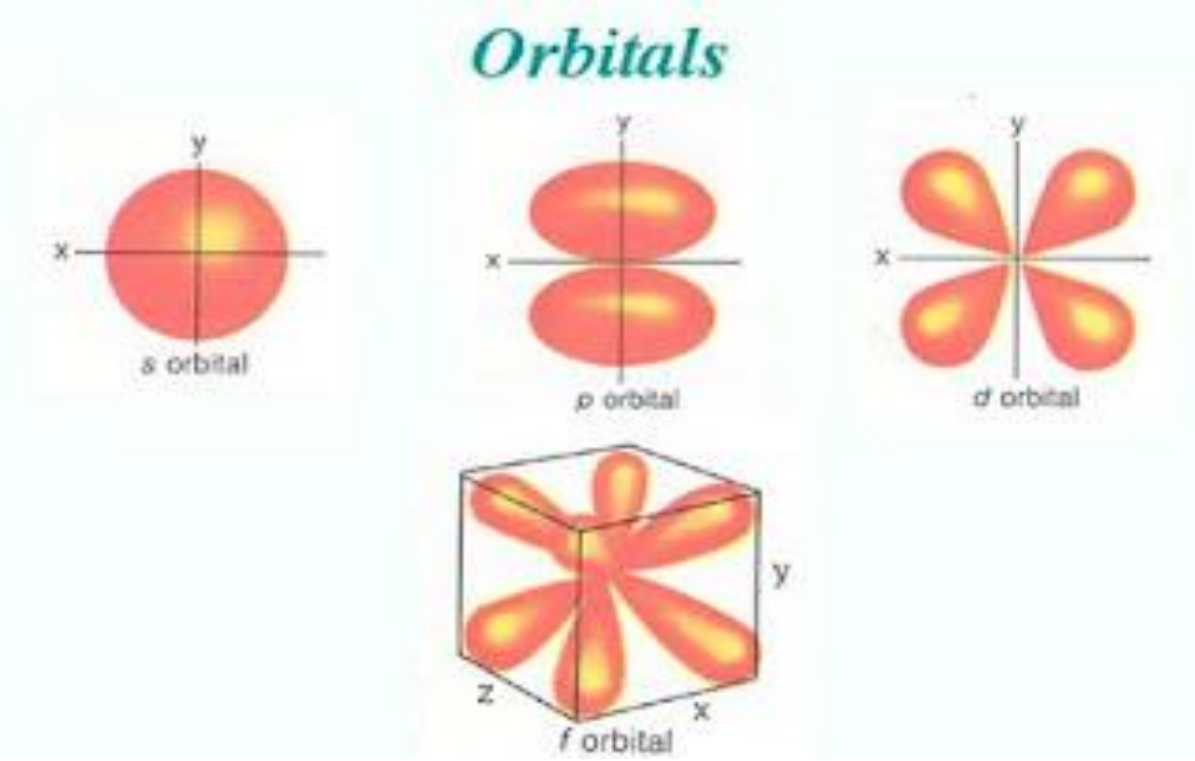
Chemistry
Atomic Orbitals

An atomic orbital is a mathematical function that describes the wave-like behavior of either one electron or a pair of electrons in an atom. This function can be used to calculate the probability of finding any electron of an atom in any specific region around the atom's nucleus. The term may also refer to the physical region defined by the function where the electron is likely to be.



Atomic orbitals are typically categorized by n, l, and m quantum numbers, which correspond to the electron's energy, angular momentum, and an angular momentum vector component, respectively. Each orbital is defined by a different set of quantum numbers and contains a maximum of two electrons. The simple names s orbital, p orbital, d orbital and f orbital refer to orbitals with angular momentum quantum number l = 0, 1, 2 and 3 respectively. These names indicate the orbital shape and are used to describe the electron configurations.

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The electron orbitals presented here represent a volume of space within which an electron would have a certain probability. For example, in a simple lowest-energy state hydrogen atom, the electrons are most likely to be found within a sphere around the nucleus of an atom. In a higher energy state, the shapes become lobes and rings. With the exception of the *n* = 1 orbital, all orbitals in the top row are cutaway to show the concentric spheres.