

Rules for Atomic Structure

1. All atoms have the same basic structure, regardless of element: a central nucleus and electrons in orbits.
2. There are three subatomic particles that make up all atoms everywhere in the universe: protons, electrons and neutrons.
3. The protons and neutrons have the same mass, 1 amu, and are located in the nucleus.
4. Electrons orbit or spin around the nucleus at incredible speeds.
5. Electrons mass is negligible.
6. For most atoms there are too many electrons, they get crowded and won't orbit close; this is due to electronegative repulsion (they repulse each other).
7. Electrons orbit at different altitudes, or different distances, from the nucleus.
8. So that each electron maintains the maximum distance between itself and other electrons, due to electronegative repulsion, the further you go out in orbits the faster the electron is moving.
9. Electrons *do not* merely orbit at any distance. The distances that electrons form orbits are very specific and determined. We call these distances or heights that the electrons orbit electron energy levels or just energy levels or energy layers. These are also called the electron orbitals and principle energy levels. Somewhat similar to an onion.
10. Because each level is at a *very* specific distance, the energy at each level is a known, determined amount. Hence why we call them energy levels. As one goes outward in an atom each energy level increases in energy, and increases by certain amounts of energy. The quantity of energy that each level increases by is the same quantity, and is called quanta. This is the origin for the term Quantum Mechanics in nuclear chemistry.
11. In physics energy and motion are related. The more energy something has the faster it moves. The less energy something has the slower it moves.
12. Electrons can jump or move from one energy level to another (drop or climb in orbit). For electrons to do this they must gain or lose specific amounts of energy, quanta. If an electron drops to a lower energy level it has lost energy or slowed down. If an electron climbs to a higher energy level it has gained energy or sped up. Also the vice versa is true. If an electron loses energy it drops to a lower energy level (the electron has dropped to a lower energy state) and if the electron gains energy it climbs to a higher energy level (the electron climbed to a higher energy state).