

15.11: End of Chapter Key Terms

Atomic Theory and the Periodic Table Key Terms

1. **Atom:** The smallest unit of an element that retains the properties of that element, consisting of protons, neutrons, and electrons.
2. **Nucleus:** The dense central core of an atom, containing protons and neutrons.
3. **Proton:** A positively charged subatomic particle found in the nucleus of an atom.
4. **Neutron:** A neutral subatomic particle found in the nucleus of an atom.
5. **Electron:** A negatively charged subatomic particle that orbits the nucleus of an atom.
6. **Atomic Number (Z):** The number of protons in the nucleus of an atom, which determines the element's identity.
7. **Mass Number (A):** The total number of protons and neutrons in the nucleus of an atom.
8. **Isotope:** Atoms of the same element with the same number of protons but different numbers of neutrons.
9. **Atomic Mass Unit (amu):** A unit of mass used to express atomic and molecular weights, approximately equal to the mass of a proton or neutron.
10. **Atomic Mass:** The weighted average mass of the isotopes of an element, typically expressed in atomic mass units (amu).
11. **Electron Cloud:** The region around the nucleus where electrons are likely to be found.
12. **Orbital:** A region of space around the nucleus where an electron is likely to be found, described by quantum numbers.
13. **Quantum Numbers:** Numbers that describe the properties of atomic orbitals and the properties of electrons in orbitals.
14. **Principal Quantum Number (n):** Indicates the relative size and energy of atomic orbitals; larger n values correspond to higher energy levels.
15. **Angular Momentum Quantum Number (l):** Describes the shape of an atomic orbital; values range from 0 to $n-1$.
16. **Magnetic Quantum Number (m_l):** Describes the orientation of the orbital in space; values range from $-l$ to $+l$.
17. **Spin Quantum Number (m_s):** Describes the spin of an electron; can be $+\frac{1}{2}$ or $-\frac{1}{2}$.
18. **Electron Configuration:** The arrangement of electrons in an atom's orbitals, described by the distribution of electrons among energy levels and orbitals.
19. **Aufbau Principle:** States that electrons fill atomic orbitals of the lowest available energy levels before occupying higher levels.
20. **Pauli Exclusion Principle:** States that no two electrons in an atom can have the same set of four quantum numbers.
21. **Hund's Rule:** States that electrons will fill degenerate orbitals (orbitals of the same energy) singly before pairing up.
22. **Periodic Table:** A tabular arrangement of elements in order of increasing atomic number, with elements having similar properties placed in vertical columns (groups).
23. **Period:** A horizontal row in the periodic table, where elements have the same number of electron shells.
24. **Group (Family):** A vertical column in the periodic table, where elements have similar chemical properties and the same number of valence electrons.
25. **Valence Electrons:** Electrons in the outermost shell of an atom, which determine the chemical properties and reactivity of the element.
26. **Alkali Metals:** Elements in Group 1 of the periodic table (excluding hydrogen), characterized by having one valence electron.
27. **Alkaline Earth Metals:** Elements in Group 2 of the periodic table, characterized by having two valence electrons.
28. **Transition Metals:** Elements in Groups 3-10 of the periodic table, characterized by having d electrons.
29. **Halogens:** Elements in Group 17 of the periodic table, characterized by having seven valence electrons.
30. **Noble Gases:** Elements in Group 18 of the periodic table, characterized by having a full valence shell of electrons, making them very stable and unreactive.
31. **Lanthanides:** A series of elements from atomic numbers 57 to 71, characterized by filling of 4f orbitals.
32. **Actinides:** A series of elements from atomic numbers 89 to 103, characterized by filling of 5f orbitals.
33. **Metals:** Elements that are typically shiny, conductive, malleable, and ductile.
34. **Nonmetals:** Elements that are typically not shiny, poor conductors, and brittle in solid form.
35. **Metalloids:** Elements with properties intermediate between metals and nonmetals.
36. **Atomic Radius:** The distance from the nucleus to the outermost electron shell of an atom.
37. **Ionization Energy:** The energy required to remove an electron from a gaseous atom or ion.
38. **Electron Affinity:** The energy change that occurs when an electron is added to a neutral atom in the gas phase.

- 39. **Electronegativity:** A measure of the ability of an atom in a chemical compound to attract electrons.
- 40. **Periodic Trends:** Patterns observed in the periodic table for properties such as atomic radius, ionization energy, electron affinity, and electronegativity.

15.11: End of Chapter Key Terms is shared under a [CC BY-NC-SA](#) license and was authored, remixed, and/or curated by LibreTexts.