

Orbital Filling Rules

1. Pauli Exclusion Principle

No two electrons can have the same 4 quantum numbers

An orbital has a maximum of 2 electrons of opposite spin

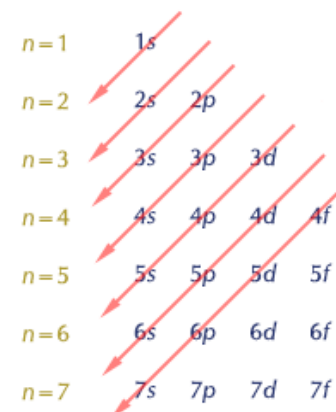
2. Aufbau/Build-up Principle

Fill 1 e⁻ at a time. Lower energy levels fill before higher energy levels

3. Hund's Rule

Electrons only pair after all orbitals at an energy level have 1 electron

4. Madelung's Rule

Orbitals fill in the order of the value of $n + l$ 

$n+l$	1s	2s	2p	3s	3p	4s	3d	4p	5s	4d	5p	6s	4f	5d	6p	7s	5f	6d	7p	8s	...

Three Different Types of Notation used for Electron ConfigurationsSpectroscopic (spdf) Notation:

Example: $1s^2 2s^2 2p^6 3s^2 3p^3$ Which element is this?

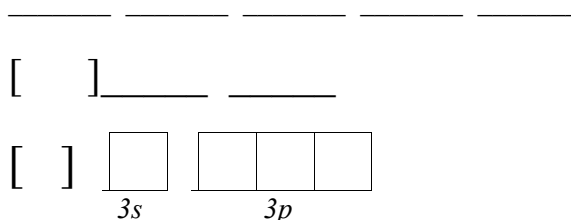
Orbital Box Notation:

Example:

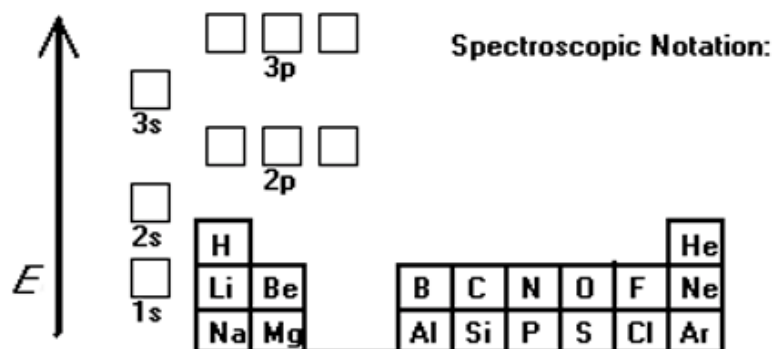
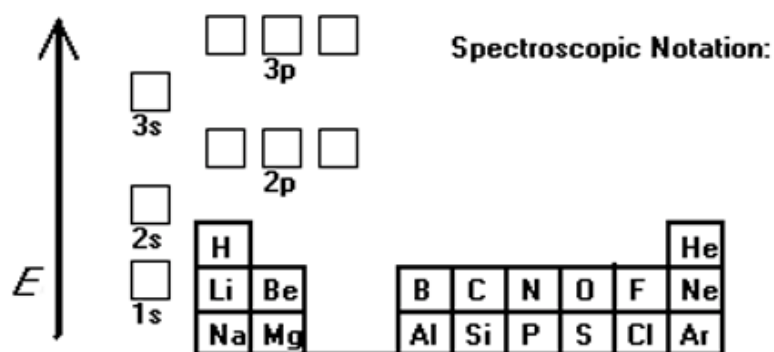
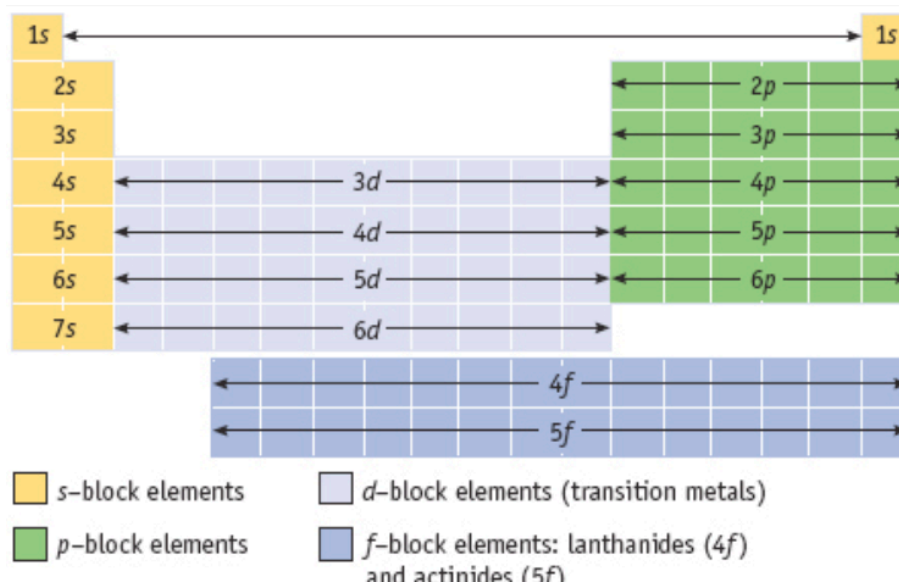
1s	2s	2p	3s	3p	4s	3d

Noble Gas Notation:

Example: Sulfur (Z=16)



Blocks of the Periodic Table





H																	H	He
Li	Be											B	C	N	O	F	Ne	
Na	Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra	Ac																
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu					
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr					