

Quantum Mechanical Model of an Atom

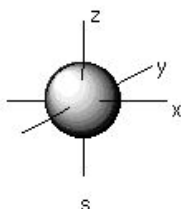
The quantum mechanical model determines the allowed energies an electron can have and **how likely** it is to find the electron in various locations around the nucleus.

atomic orbital - region of space in which there is a high probability to find an electron

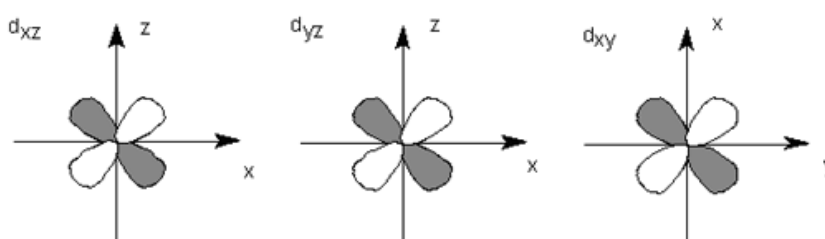
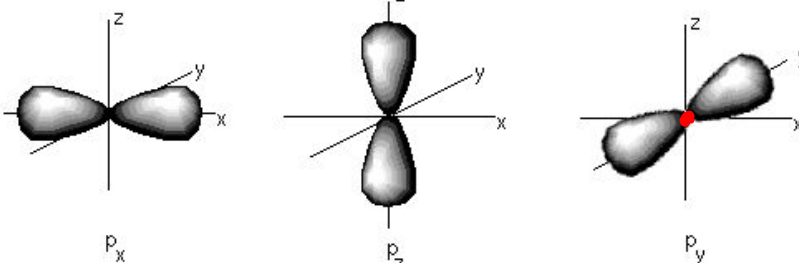
Principal quantum numbers (n) represent energy levels of electrons (i.e., $n = 1, 2, 3, 4$, etc.)

There may be several orbitals with different shapes at different energy levels.

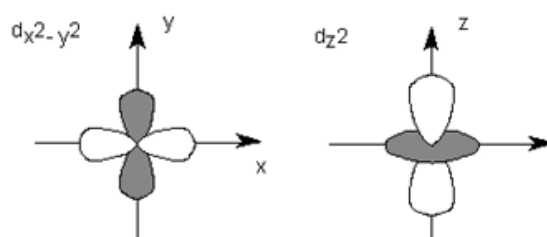
s orbital

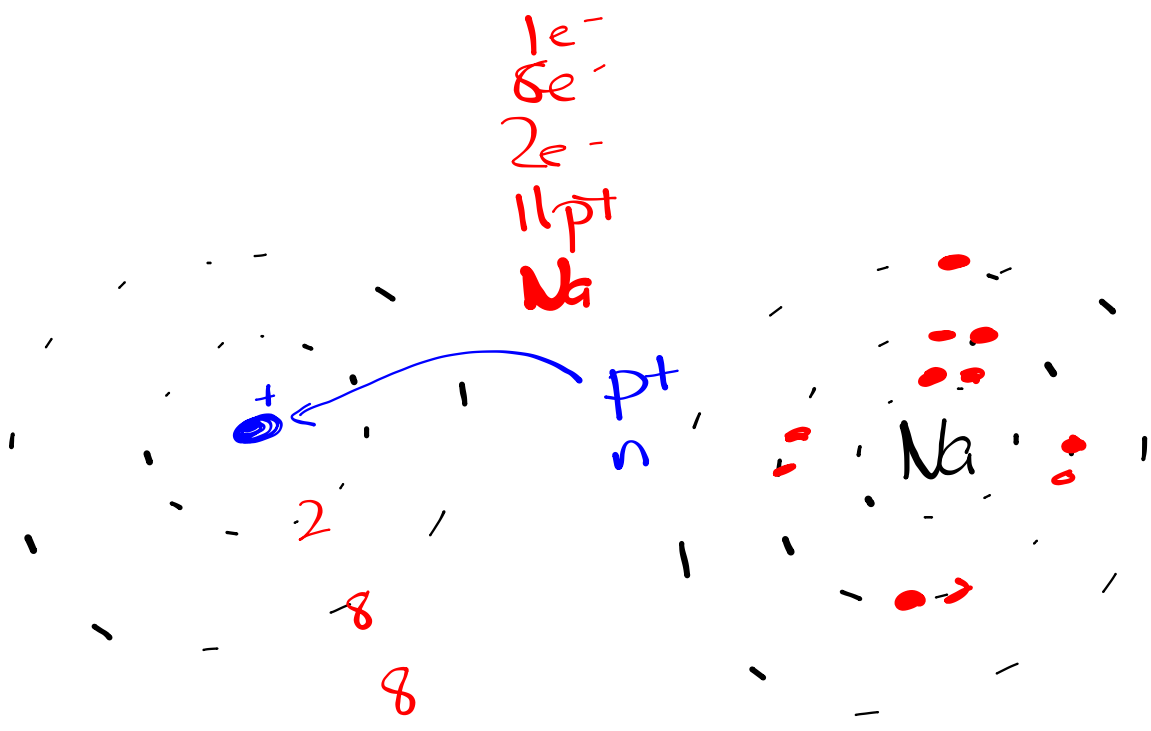


p orbitals



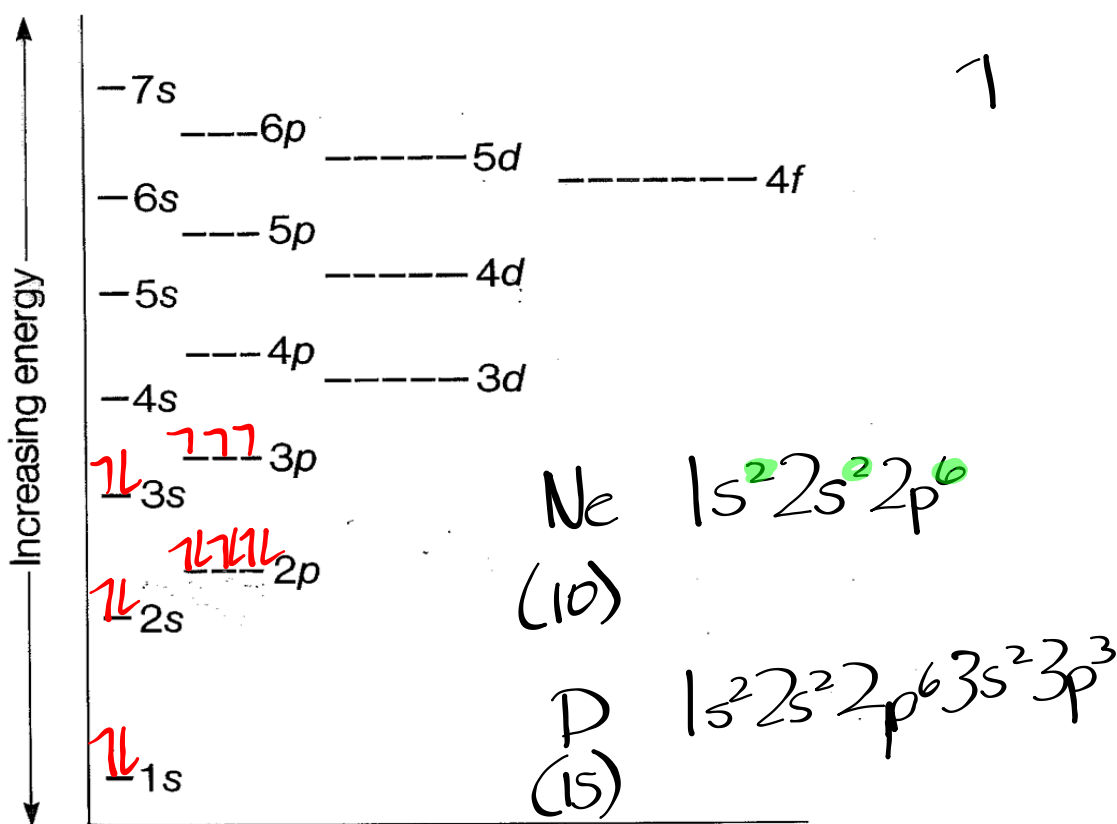
d orbitals





Electron Configurations

Aufbau Diagram



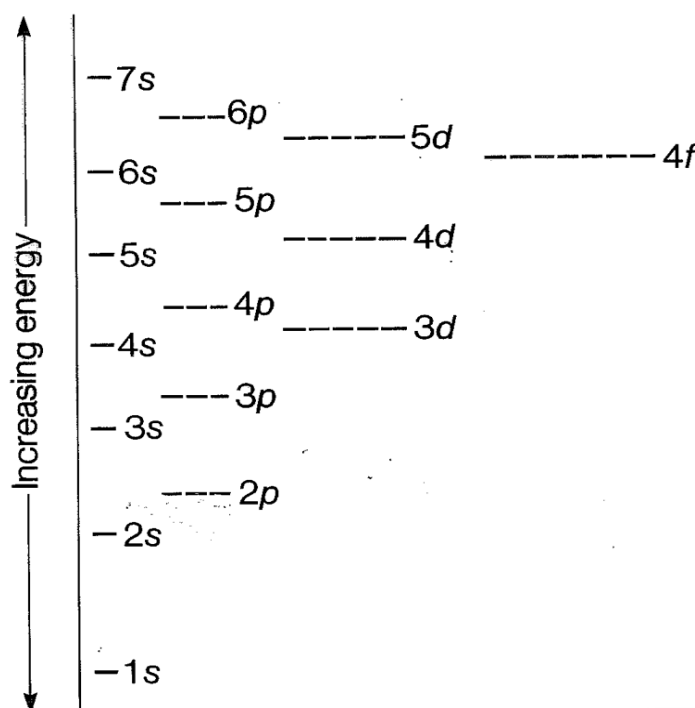
Ni

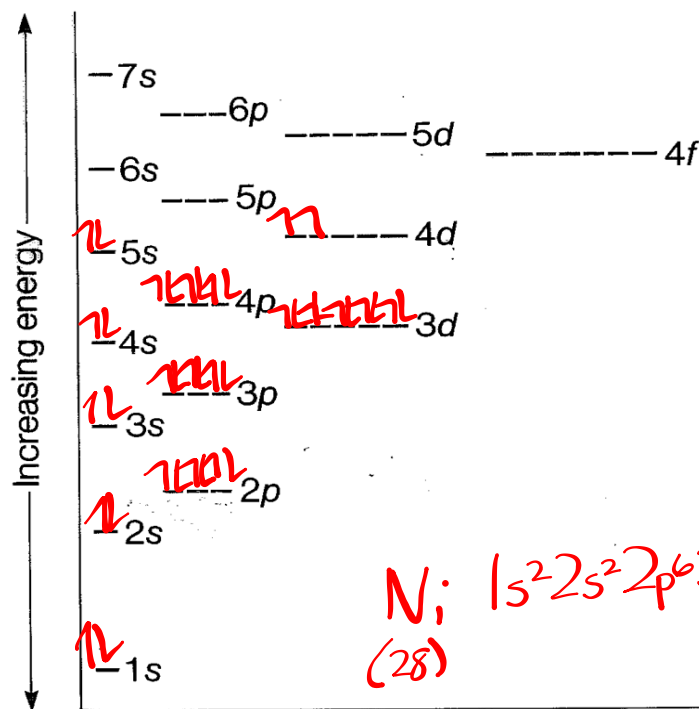
Zr

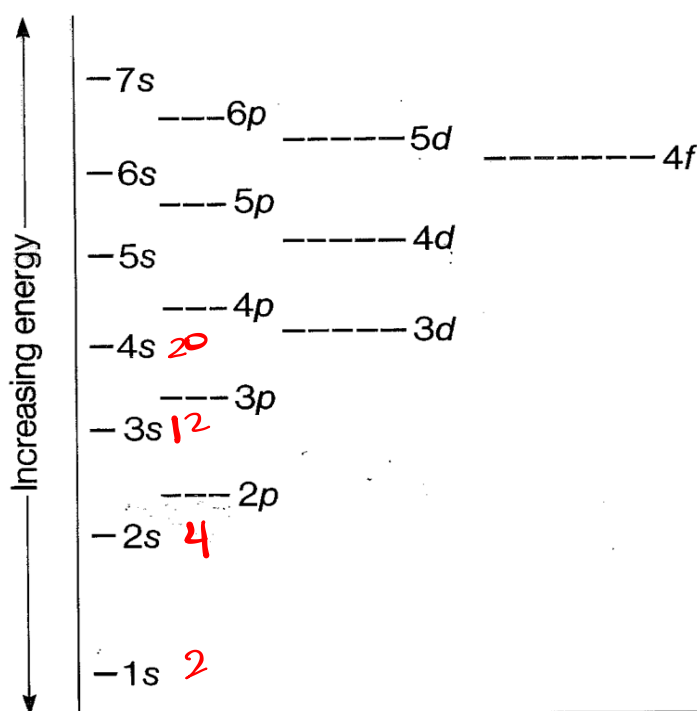
Aufbau principle - electrons occupy orbitals of lowest energy first

Pauli exclusion principle- an atomic orbital can describe at most two electrons

Hund's rule - one electron enters each orbital until all orbitals contain one electron with the same spin








Homework

Section 5.1 & 5.2 p. 127 - 137

p. 132 #1-7

p. 135 #8-9

 <http://www.chalkbored.com/lessons/chemistry-12/periodic-configurations.pdf>