*AP Chemistry*

*Electron Configurations*

 

Summarize the three rules for writing electron configurations:

* Aufbau principle
* Pauli Exclusion Principle
* Hund’s Rule

Phosphorus

|  |
| --- |
| Orbital notation (arrows and boxes) |
| Spectroscopic notation | Noble gas notation |

Number of valence electrons:

* Iron

|  |
| --- |
| Orbital notation (arrows and boxes) |
| Spectroscopic notation | Noble gas notation |

 Number of valence electrons:

* Gallium

|  |
| --- |
| Orbital notation (arrows and boxes) |
| Spectroscopic notation | Noble gas notation |

Number of valence electrons:

Exceptional Electron Configurations…be aware of the patterns, no need to memorize!

* Group 6: ns1 (n-1)d5 The spherically symmetric electron distribution of d5 has fewer electron-electron repulsions and therefore is lower in energy than the predicted configuration
* Group 12 ns1 (n-1)d10 with similar reasoning as above…having all the d orbitals filled completely with a half-filled s orbital minimizes repulsions
* Lanthanides and actinides are often d1 s2 or have unoccupied d sublevels, “promoting” electrons into the f sublevel

Valence electrons

* + Electrons in fully filled d and f orbitals are NOT considered to be valence electrons
	+ However, electrons in partially filled d orbitals are considered to be valence electrons!
		- Strictly speaking, d block elements follow the 18-electron rule, not the octet rule