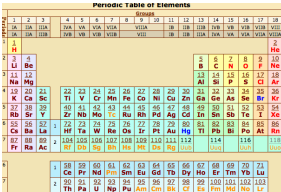


Periodic Table

Part IV: Periodic Trends

Trends

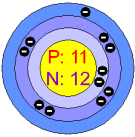
A. Atomic Radius (size)



Trends




A. Atomic Radius (size)

- The atomic radius of an element is half of the distance between the centers of two atoms of that element that are just touching each other.
- Relative size of ions and their parents:
 - Cations are smaller than their parents.
 - Anions are larger than their parents.





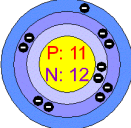
Trends
A. Atomic Radius (size)

- Down a column?
Atomic size generally **increases** as we move down a group of the periodic table. As we descend, electrons are added to successively higher energy levels.

H	
Li	
Na	

Trends
A. Atomic Radius (size)

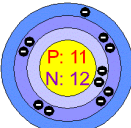
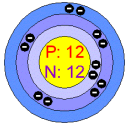
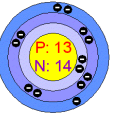
- Down a column? (con't)
The nuclear charge also increases because of additional protons. However, the full nuclear charge is shielded from the outer electrons because of the inner electrons and distance from the nucleus.

H	
Li	
Na	

Trends
A. Atomic Radius (size)

Across a row? As we move from left to right across a period:

1. more electrons are in the same energy levels
2. and more protons are in the nucleus

Na	Mg	Al
		

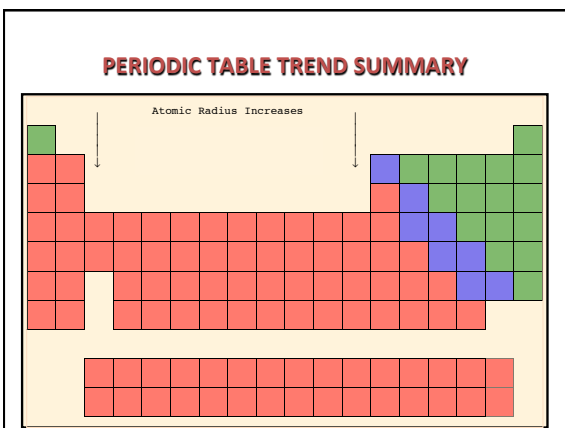
Trends

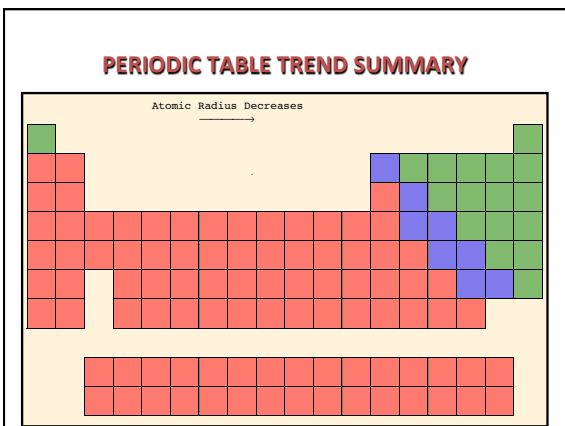
A. Atomic Radius (size)

Across a row? (continued)

3. which gives the right-hand elements a larger electron-proton ("electrostatic") attraction
4. and therefore, pulls the electrons closer to the nucleus.

So the **atomic size** generally **decreases** as you move left to right across a period.





Trends B. Electronegativity

Trends B. Electronegativity

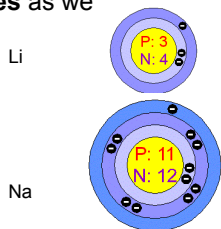
Ability of an atom in a molecule to attract electrons to itself.

It is a measure of how "greedy" an atom is for electrons.

Exceptions: Noble gases are not included in this general trend.

Trends B. Electronegativity

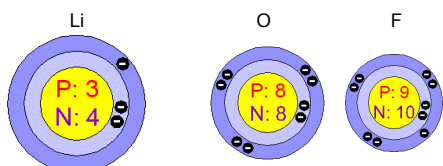
- Down a column? Electronegativity generally **decreases** as we go down a group.



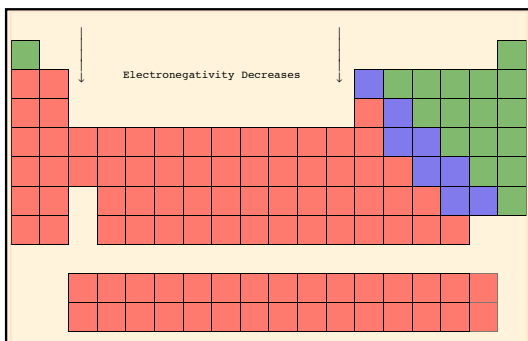
Trends

B. Electronegativity

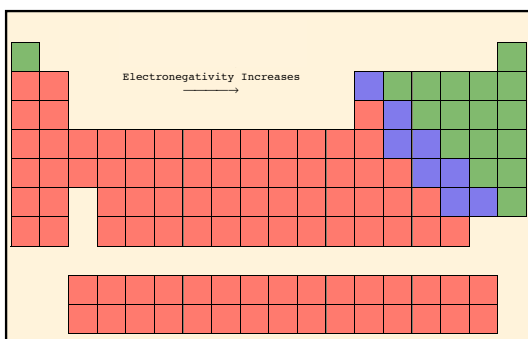
- Across a row? Electronegativity generally **increases** as we go across a period.



PERIODIC TABLE TREND SUMMARY



PERIODIC TABLE TREND SUMMARY



Trends C. Ionization Energy

Periodic Table of Elements

The table shows ionization energy values for various elements, with a color-coded trend: red for high ionization energy (top-left) and blue for low ionization energy (bottom-right).

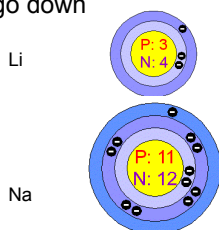
Trends C. Ionization Energy

The amount of energy required to remove an electron from an atom.
It is a measure of how much an atom wants its own electrons.

Exceptions: Noble gases are not included in this general trend.

Trends C. Ionization Energy

- Down a column? Ionization energy **decreases** as we go down a group

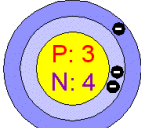


Trends

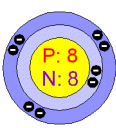
C. Ionization Energy

- Across a row? Ionization energy **increases** as we go across a period.


Li

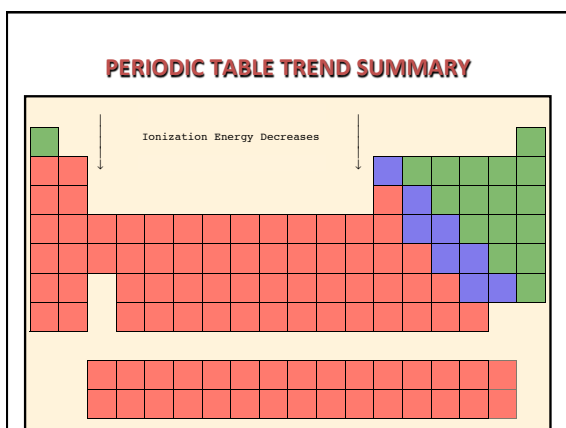


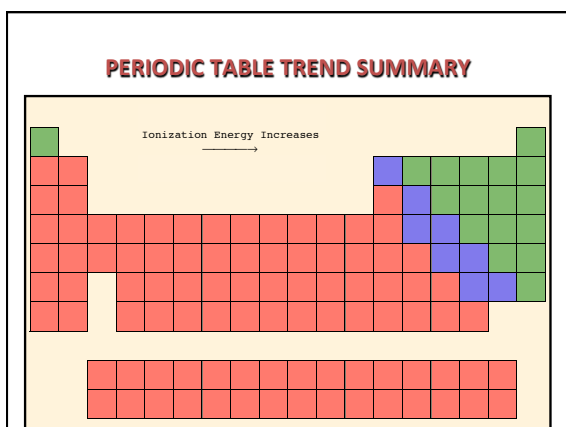
O



F







PERIODIC TABLE TREND SUMMARY

- **Moving Left → Right**
 - Atomic Radius Decreases
 - Ionization Energy Increases
 - Electron Affinity Increases
 - Electronegativity Increases
- **Moving Top ↓ Bottom**
 - Atomic Radius Increases
 - Ionization Energy Decreases
 - Electron Affinity Decreases
 - Electronegativity Decreases



INSERT
PICTURE
