Periodic Properties of the Elements – Study Guide

*sections 6.5 in OpenStax*

**Periodic Properties**

Elements in the same column have \_\_\_\_\_\_\_\_\_\_\_\_\_(*similar or different*) chemical and physical properties because they have the \_\_\_\_\_\_\_\_\_\_ (*same or different*) number of valence electrons in the same kinds of orbitals.

**Trend in Atomic Radius – Main Group**

Atomic Radius \_\_\_\_\_\_\_\_\_\_\_\_ (*increases or decreases*) down a group because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Atomic Radius \_\_\_\_\_\_\_\_\_\_\_\_(*increases or decreases*) across a period because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*Which atom is larger?* Mg or Ba *Which atom is smaller?* Si or Cl

**Trends in Ionic Radius**

Cations are much \_\_\_\_\_\_\_\_\_\_\_\_ (smaller, larger) than their corresponding atoms because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Anions are much \_\_\_\_\_\_\_\_\_\_\_\_\_ (smaller, larger) than their corresponding atoms because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*Which is larger?:* Na or Na1+ *Which is smaller?:* N or N3-

**Trends in 1st Ionization Energy**

The **ionization energy** of an atom is defined as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1st Ionization Energy generally \_\_\_\_\_\_\_\_\_\_\_\_ (*increases or decreases*) down a group because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1st Ionization Energy generally \_\_\_\_\_\_\_\_\_\_\_\_\_(*increases or decreases*) across a period because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*Which atom has the larger 1st ionization energy?* F or I

*Which atom has the smaller 1st ionization energy?* Na or S

**Trends in Electron Affinity**

The **electron affinity** of an atom is defined as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Electron Affinity generally \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(*increases or decreases*) across a period.

*Which atom has the higher electron affinity?* Se or Br

**Trends in Metallic Character**

Metallic Character \_\_\_\_\_\_\_\_\_\_\_\_ (*increases or decreases*) down a group because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Metallic Character \_\_\_\_\_\_\_\_\_\_\_\_(*increases or decreases*) across a period because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*Which atom has more metallic character?* K or Cs

*Which atom has less metallic character?*  Ga or As

**End of Chapter 6 Practice Problems**

#67, 69, 73, 75, 77

For detailed solutions to these problems, go to the [OpenStax website](https://openstaxcollege.org/textbooks/chemistry/resources) and download the “Student Answer and Solution Guide.”