

Reviewing Periodic & Group Trends

(Honors Chemistry)

1. Which corner of the periodic table is the largest for each of the following trends? (*Reasons for group & period*)

a. Nuclear Charge **Bottom Right = Large Atomic Number**
(NOT ENC)

b. Shielding Effect **Bottom due to more Energy Levels**

c. Atomic Size **Bottom Left**

d. Ionization Energy **Upper Right largest**

e. Ionic Size **more electrons lost = smaller atom gets**
more electrons gained = bigger atoms get

f. Electronegativity **Upper right largest**

2. Is nuclear charge positive or negative? Explain.

Positive: protons are in the nucleus

3. Does nuclear charge increase or decrease across a period?

Increase because atomic number increases

4. What do shielding electrons shield?

The nucleus' pull from the valence electrons

5. Does the number of shielding electrons increase or decrease as you move down a group? Explain.

Increase: More energy levels

6. How many valence electrons are in the following groups?

a. 1A **1** c. 3A **3** e. 5A **5** g. 7A **7**

b. 2A **2** d. 4A **4** f. 6A **6** h. 8A **8**

7. What is the ionic charge of the atoms in the following groups?

a. 1A **1+** c. 3A **3+** e. 5A **3-** g. 7A **1-**

b. 2A **2+** d. 4A **4+** f. 6A **2-** h. 8A **NONE**

8. What is the effective nuclear charge of the following groups?

a. 1A **+1** c. 3A **+3** e. 5A **+5** g. 7A **+7**

b. 2A **+2** d. 4A **+4** f. 6A **+6** h. 8A **+8**

9. What effect does the "effective nuclear charge" have on the size of an atom? Explain.

A large ENC causes an atom to get smaller since it is pulling on the valence electrons.

10. As you move down a group, why does atomic size increase?

The number of Energy Levels increases

11. Does ionization energy increase or decrease as you move across the period?

Increase because ENC increases

12. Why is it harder to remove two electrons from an atom than it is to remove one electron?

As electrons are removed, the nucleus pulls harder

13. When sodium and magnesium become ions, do they form anions or cations? Explain.

Cations

a. After they become ions, are they bigger or smaller than their neutral form? Explain

Smaller: because they lose an energy level

b. Which of the atoms is bigger when they become ions? Explain

Sodium: Mg lost 2 electrons, which allows nucleus to pull more

14. When Sulfur and chlorine become ions, do they form anions or cations? Explain.

Anions

a. After they become ions, are they bigger or smaller than their neutral form? Explain

Bigger:

b. Which of the atoms is bigger when they become ions?

Sulfur: it gained more electrons

15. What is another name for the Group A elements?

Representative Elements

16. What is another name for the Group B elements?

Transition Elements

17. Compare the basic properties of metals, nonmetals, and metalloids.

mobile electrons allow metals to conduct heat and electricity

18. Compare the manner in which the first periodic tables and modern periodic tables were arranged.

Arranged by Atomic Mass instead of Atomic Number

19. What happens to Atomic Radius as you move across the period?

It decreases because ENC increases.

20. What happens to electronegativity as you move up a group (from bottom to top)?

Increases

21. Which is bigger: a neutral atom of Oxygen or an Oxygen ion? Explain. It gained electrons

22. Which is bigger: a neutral atom of Strontium or a Strontium ion? Sr²⁺ shrinks

23. Which element on the periodic table has the highest electronegativity?

Fluorine

24. Which element on the periodic table has the largest atomic radius?

Francium

25. Which element on the periodic table has the highest first ionization energy?

Fluorine