

Periodic Trends Worksheet

1. The properties of the elements in the periodic table vary from one element to another as you go down a group. Four of these variations are :

1. Atomic radius ✓ 3. Electronegativity

(metals) 2. Chemical reactivity ✓ 4. Ionization Energy

Which of these variations will increase as you go down group 1?

- (A) 1 and 2 B) 1 and 3 C) 2 and 4 D) 3 and 4

2. Which of the following elements has the greatest atomic radius?

- A) Boron (B) (B) Lithium (Li) C) Neon (Ne) D) Nitrogen (N)

3. Certain properties of elements and their description are listed below.

Match the description with the correct property.

	Description	Property
3	a) Determines the physical and chemical properties of an element.	1. Electronegativity
5	b) A pattern that occurs across a period or within a group of the periodic table.	2. Atomic radius
2	c) In the same period elements that have more protons in their nuclei tend to pull their electrons closer.	3. Electron configuration
1	d) Fluorine has a higher tendency to attract electrons than oxygen.	4. Chemical reactivity
4	e) The fewer electrons it has on the outermost shell, the more reactive a metal is.	5. Periodic trend

4. Of the following elements, which one would have the largest radius?

- A) Hydrogen (H) C) Sodium (Na)
 (B) Cesium (Cs) D) Potassium (K)

5. Of the following elements, which one would have the largest ionization energy?

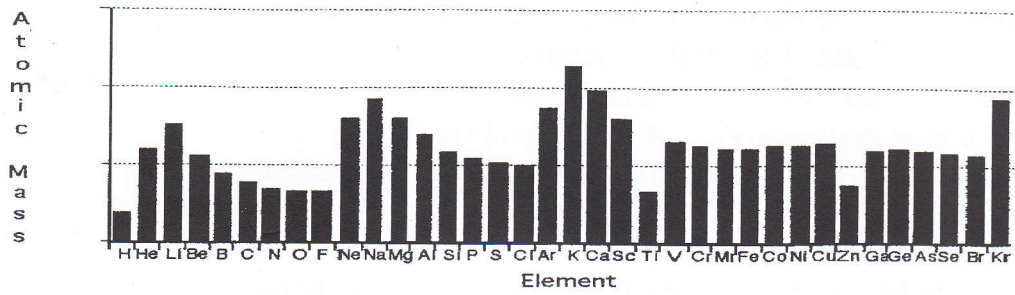
- (A) Hydrogen (H) C) Sodium (Na)
 B) Cesium (Cs) D) Potassium (K)

6. Why does fluorine have high ionization energy?

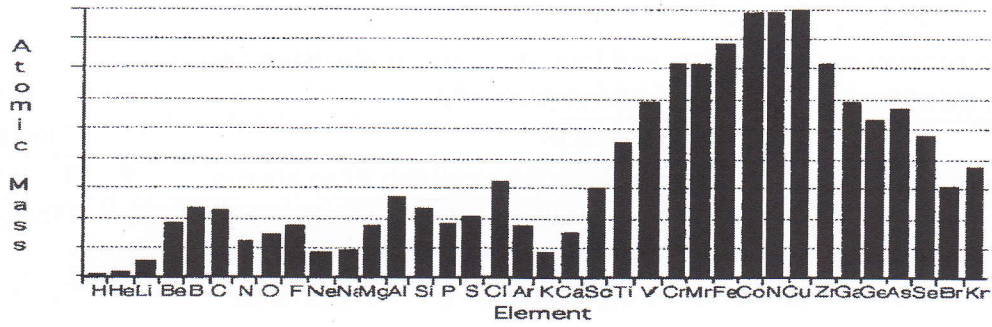
- A) It has a low number of shells and a low number of protons.
 (B) It has a low number of shells and a high number of protons.
 C) It has a high number of shells and a low number of protons.
 D) It has a high number of shells and a high number of protons.

7. Which one of the following graphs represents the progression of the atomic masses in the periodic table?

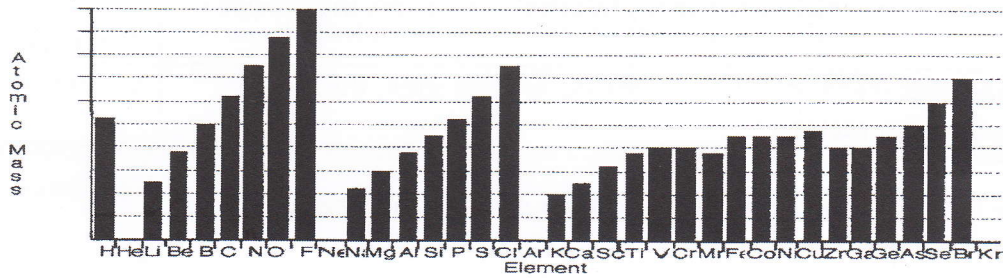
A)



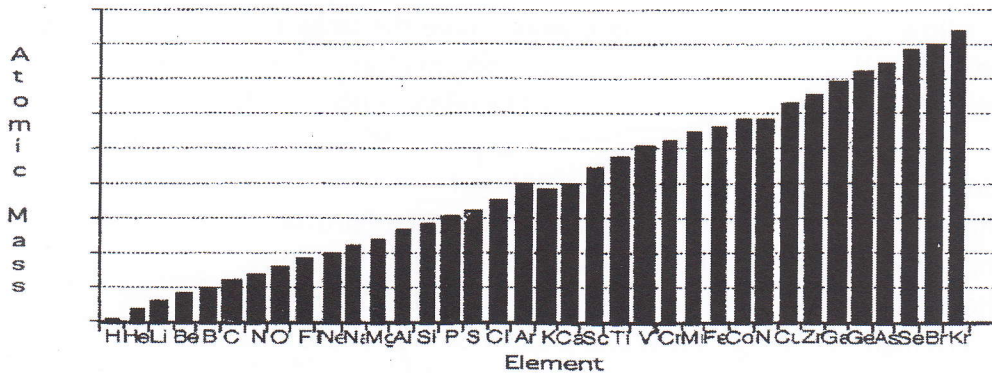
B)



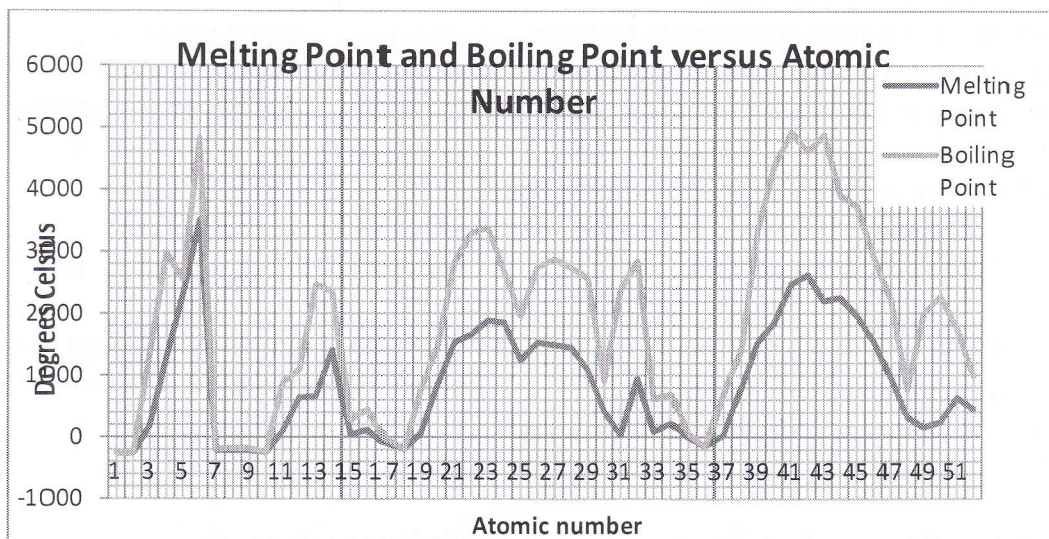
C)



D)



8. The graph below represents the melting point and boiling point of element 1 to 52

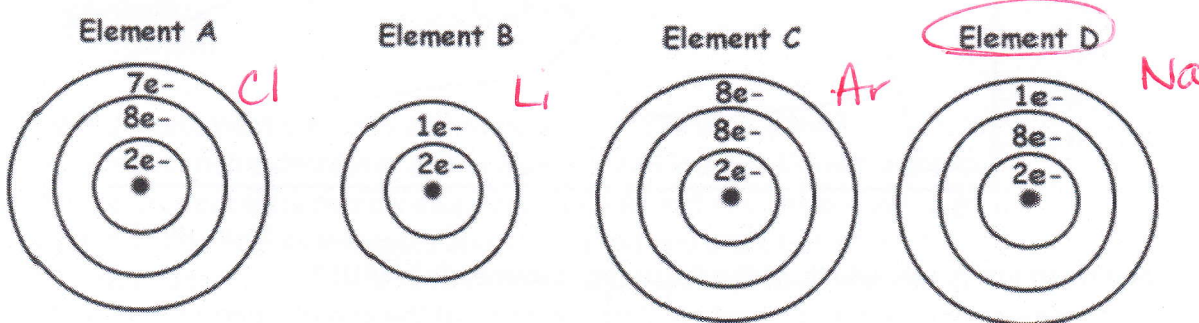


Data Taken from: <http://www.science.co.il/PElements.asp>

Which statement best describes the periodicity of melting point and boiling point for the first 52 elements of the periodic table?

- A) The melting point decreases within a period, whereas the boiling point increases
- B) The melting point increases within a period, whereas the boiling point decreases
- C) Both the melting point and boiling point increases, then decreases within a period
- D) Both the melting point and boiling point decreases, then increases within a period

9. Which of these elements has the lowest ionization energy?



10. Which of these elements would have the lowest ionization energy?

- A) Noble gases
- B) Metalloids
- C) Alkali metals
- D) Halogens

11. As you move from the top to the bottom of the periodic table:

- A) ionization energy increases and electronegativity increases
- B) ionization energy decreases and electronegativity increases
- C) ionization energy increases and electronegativity decreases
- D) ionization energy decreases and electronegativity decreases

12. Electronegativity tends to increase as you
- A) go down a column of the periodic table.
 - B) go from left to right across the periodic table.
 - C) go toward the middle of the periodic table.
 - D) go from the upper left-hand corner to the lower right-hand corner of the periodic table.

13. Which of the following will have a larger radius than Zinc?

- A) Gallium
- B) Aluminum
- C) Magnesium
- D) Strontium

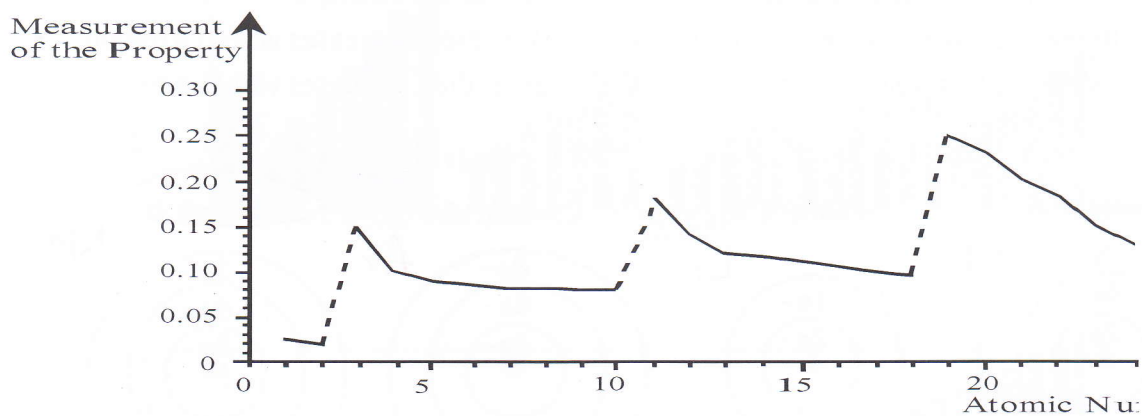
14. As atoms of elements in group seven are considered in order from top to bottom, the electronegativity of each successive element...

- A) Decreases
- B) Increases
- C) Remains the same
- D) Increases then decreases

15. As you move across the periodic table atoms tend to get smaller because, _____.

- A) the atoms have more mass
- B) the atoms have less mass
- C) the atoms have more protons
- D) the atoms have less electrons.

16. The following graph shows the measurement of a property of certain elements as a function of their atomic number.

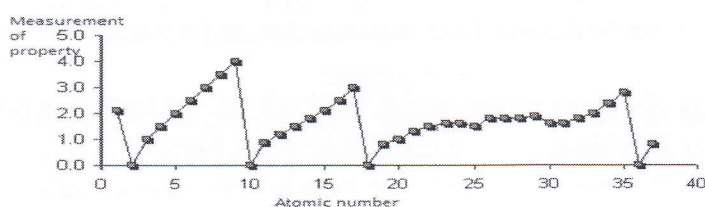


According to this graph, which of the following statements is TRUE?

- A) The measurement of this property is always greater at the end of a period than at the beginning of a period.
- B) The measurement of this property decreases and then increases across a period.
- C) The measurement of this property decreases from left to right across a period.
- D) The measurement of this property is greater for the last element of Period 2 than for the first element of Period 3.

17. Which of the following statements are true for the atomic radius within the same period?
- I) Moving from left to right across a given period, there is an increase in the number of electrons, protons and neutrons, and thus the atomic radius increases.
 - II) The atomic radius decreases with the increasing atomic number across a given period.
 - III) The atomic radius is independent from the type of atom within a given period.
 - IV) Moving from left to right across a given period, there is an increase in the number of protons and electrons. Therefore the electric forces between nucleus and shell increases, thus reducing the atomic size.
- A) I and III B) I, II and IV C) II and III **D) II and IV**

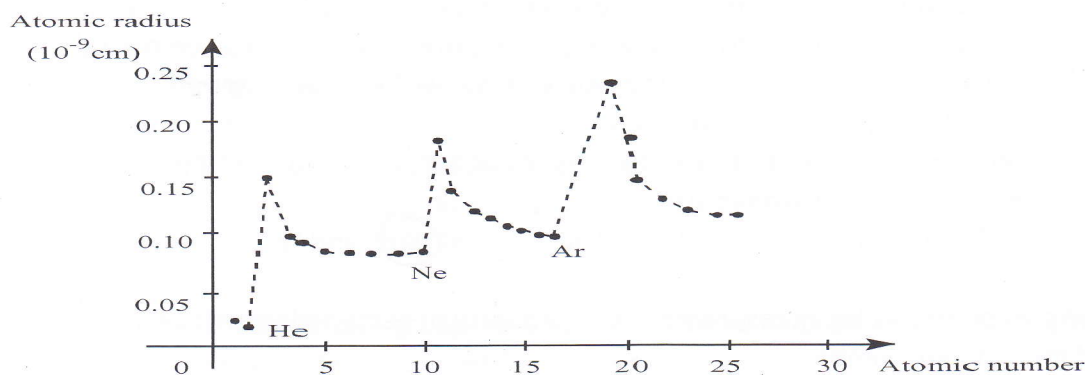
18. The following graph shows the measurement of a property of certain elements as a function of their atomic number.



According to the graph which of the following statements is true?

- A) The property represented on the graph is ionization.
 - B) The property represented on the graph is electronegativity.**
 - C) The property represented on the graph is atomic radius.
 - D) The property represented on the graph is reactivity.
- * 0 for noble gases
19. Which of these elements has the lowest electronegativity?
- A) sodium**
 - B) aluminum
 - C) phosphorus
 - D) sulfur
20. Which statement correctly and completely identifies a trend?
- A) Atomic radius decreases across a period and increases down a group.**
 - B) Electronegativity decreases across a period and decreases down a group.
 - C) Ionization energy increases across a period and increases down a group.
 - D) Ionic radius increases across a period and increases down a group
21. As you move up and to the right on the periodic table:
- A) atomic radius increases and electronegativity increases
 - B) atomic radius decreases and electronegativity increases**
 - C) atomic radius increases and electronegativity decreases
 - D) atomic radius decreases and electronegativity decreases
22. Which of the following will have a higher ionization than arsenic (As)?
- A) Calcium (Ca)
 - B) Neon (Ne)**
 - C) Germanium (Ge)
 - D) Antimony (Sb)

23. The graph below illustrates the atomic radius of certain elements as a function of their atomic numbers.



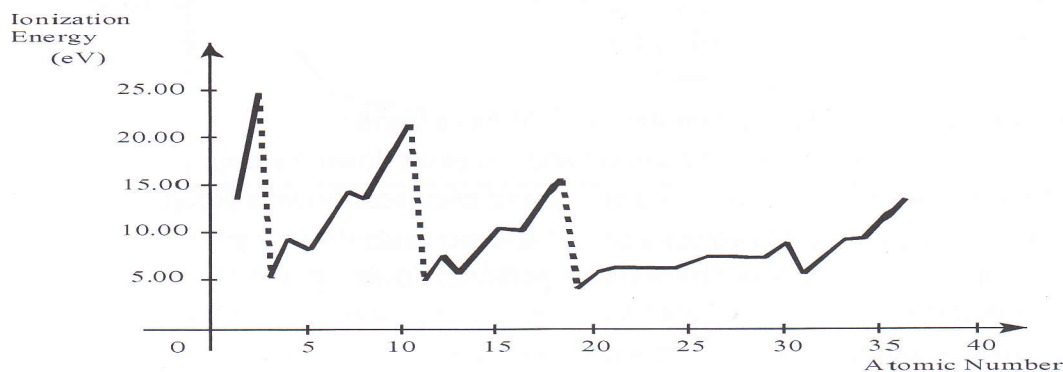
According to this graph, which statement best describes the change in the atomic radius as you move across a period?

- A) The size of the atomic radius increases as you move from left to right across a period.
- B) The size of the atomic radius decreases then increases across a period.
- C) The size of the atomic radius decreases as you move from left to right across a period.
- D) The size of the atomic radius increases and then decreases across a period.

24. The atomic radius unit is a picometer (pm). The atomic radius of F, Br, and I are 64, 114, and 138 pm respectively. From this information, estimate the atomic radius of Cl.

- A) 53 pm
- B) 65 pm
- C) 93 pm
- D) 162 pm

25. The following graph shows the ionization energies of certain elements as a function of their atomic numbers.



According to this graph, which of the following statements is TRUE?

- A) Within a period, the ionization energy usually increases as the atomic number increases.
- B) Within a period, the ionization energy usually decreases as the atomic number increases.
- C) In general, the ionization energy of the elements in Period 3 is greater than the ionization energy of the elements in Period 2.
- D) The ionization energy of the elements in Period 4 varies regularly when the atomic number increases regularly.