

Classification of Elements- The Periodic Table

1. Newlands proposed the law of octaves. Mendeleeff suggested eight groups for elements in his table. How do you explain these observations in terms of modern periodic classification?(AS1)

2. What are the limitations of Mendeleeff's periodic table? How could the modern periodic table overcome the limitations of Mendeleeff's table? (AS1)

3. Define the modern periodic Law. Discuss the construction of the long form of the periodic table. (AS1)

4. Explain how the elements are classified into s, p, d and f- block elements in the periodic table and give the advantage of this kind of classification. (AS1)

5. Write down the characteristics of the element having atomic number 17. (AS1)

Electronic configuration _____

Period number _____

Group number _____

Element family _____

No. of valence electrons _____

Valency _____

Metal or non-metal _____

• All the d- block elements (except Zn group) are known as transition elements and all the f

6. Why was the basis of classification of elements changed from the atomic mass to the atomic number? (AS1)

7. What is a periodic property? How do the following properties change in a group and period? Explain. (AS1)

i) (a) Atomic radius (b) Ionization energy (c) Electron affinity (d) Electronegativity.

ii) Explain the ionization energy order in the following sets of elements:

a) Na, Al, Cl b) Li, Be, B c) C, N, O d) F, Ne, Na e) Be, Mg, Ca. (AS1)

8. Given below is the electronic configuration of elements A, B, C, D. (AS1)

A. $1s^2 2s^2$ 1. Which are the elements coming within the same period

B. $1s^2 2s^2 2p^6 3s^2$ 2. Which are the ones coming within the same group?

C. $1s^2 2s^2 2p^6 3s^2 3p^3$ 3. Which are the noble gas elements?

D. $1s^2 2s^2 2p^6$ 4. To which group and period does the element 'C' belong

9. Elements in a group generally possess similar properties, but elements along a period have different properties. How do you explain this statement? (AS1)

10. s - block and p - block elements (except 18th group elements) are sometimes called as 'Representative elements' based on their abundant availability in the nature. Is it justified? Why? (AS1)

11. The electronic configuration of the elements X, Y and Z are given below?

a) X = 2 b) Y = 2, 6 c) Z = 2, 8, 2

i) Which element belongs to second period?

ii) Which element belongs to second group?

iii) Which element belongs to 18th group?

12. Identify the element that has the larger atomic radius in each pair of the following and mark it with a symbol (3). (AS1)

(i) Mg , Ca (ii) Li , Cs (iii) N , P (iv) B , Al

13. Identify the element that has the lower ionization energy in each pair of the following and mark it with a symbol (3). (AS1)

(i) Mg , Na (ii) Li , O (iii) Br , F (iv) K , Br

14. How does metallic character change when we move

i. Down in a group ii. Across a period?

15. Name two elements that you would expect to have chemical properties similar to Mg. What is the basis for your choice? (AS2)

16. On the basis of atomic numbers predict to which block the elements with atomic number 9, 37, 46 and 64 belongs to? (AS2)

17. Using the periodic table, predict the formula of compound formed between an element X of group 13 and another element Y of group 16. (AS2)

18. An element X belongs to 3rd period and group 2 of the periodic table. State

(a) The no. of valence electrons in it (b) The valency

(c) Whether it is metal or a non metal (AS2)

18. An element has atomic number 19. Where would you expect this element in the periodic table and why? (AS2)

19. How do you appreciate the role of electronic configuration of the atoms of elements in periodic classification? (AS6)

20. Without knowing the electronic configurations of the atoms of elements Mendeleev still could arrange the elements nearly close to the arrangements in the Modern periodic table. How can you appreciate this? (AS6)