



CHEMISTRY

BOOKS - SUPER COMPANION MADE EASY

PERIODIC CLASSIFICATION OF ELEMENTS

Text Book Questions

1. Did Döbereiner's triads also exist in the columns of Newlands' octaves? Compare and find out.



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2. What were the limitations of Dobereiner's classification?



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3. What are the limitations of the law of octaves.



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4. Use Mendeleev's Periodic Table to predict the formulae for the oxides of the following elements: K, C, Al, Si, Ba.



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5. Besides gallium, which other elements have since been discovered that were left by Mendeleev in his Periodic Table ? (Any two)



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6. What were the criteria used by Mendeleev's in creating his Periodic Table ?



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7. Why do you think the noble gases are placed in a separate group?



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8. How could the Modern Periodic Table remove various anomalies of Mendeleev's Periodic Table?



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9. Name two elements you would expect to show chemical reactions similar to magnesium. What is the basis for your choice?



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10. Name

three elements that have a single electron in their outermost shells.



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11. Name

Two elements that have two electrons in their outermost shells.



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12. Name

Three elements with filled outermost shells.



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13. Lithium, sodium, potassium are all metals that react with water to liberate hydrogen gas.

(a) Is there any similarity in the atoms of these elements?



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14. Helium is an unreactive gas and neon is a gas of extremely low reactivity. What, if anything, do their atoms have in common?



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15. In the Modern Periodic table, which are the metals among the first ten elements ?



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16. By considering their position in the Periodic Table, which one of the following elements would you expect to have maximum metallic characteristics?



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Textbook Exercise Question

1. Which of the following statements is not a correct statement about the trends when going from left to right across the periods of periodic Table?

A. The elements become less metallic in nature

B. The number of valence electrons increases.

C. The atoms lose their electrons more easily.

D. The oxides become more acidic

Answer: C



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2. Element X forms a chloride with the formula XCl which is a solid with a high melting point.

X would most likely be in the same group of the Periodic Table as

A. Na

B. Mg

C. Al

D. Si

Answer: B



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3. Which elements has

two shells, both of which are completely filled with electrons?



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4. Which elements has

The electronic configuration 2,8,2 ?



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5. Which elements has

A total of three shells, with four electrons in its valence shell ?



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6. Which elements has

A total of two shells, with three electrons in its valence shell ?



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7. Which elements has

Twice as many electrons in its second shell as in its first shell ?



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8. What property do all elements in the same column of the Periodic Table as boron have in common?



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9. What property do all elements in the same column of the Periodic Table as fluorine have in common?



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10. An atom has electronic configuration 2, 8, 7
what is the atomic number of this element ?



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11. An atom has the electronic configuration 2,
8, 7.

a] What is the atomic number of this element?

b] To which of the following elements would it
be chemically similar? (Atomic numbers are
given in parenthesis) N (7), F (9), P (15), Ar (18)



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12. The position of three elements A, B and C in the periodic Table is shown below:

Group 16	Group 17
	A
B	C

- (a) State whether A is a metal or non-metal
- (b) State whether C is more reactive or less reactive than A
- (c) Will C be larger or smaller in size than B?

(d) Which type of ion, cation or anion, will be formed by element C?



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16. Nitrogen (atomic number 7) and phosphorous (atomic number 15) belong to group 15 of the periodic table. Write the electron configurations of these two elements. Which of these is more electronegative?



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17. How does the electronic configuration of an atom related to its position in the modern periodic table ?



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18. In the modern periodic table, calcium (atomic number 20) is surrounded by elements with atomic numbers 12, 19, 21, and 38. Which of these have physical and chemical properties resembling calcium?



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19. Compare and contrast the arrangement of elements in Mendeleev's periodic table and the Modern Periodic Table.



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Additional Questions

1. The Law of Octaves was found to be applicable to elements

A. Oxygen

B. Calcium

C. Cobalt

D. Potassium

Answer: B



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2. According to Mendeelev's periodic Law, the elements were arranged in the periodic table in the order of

- A. Increasing atomic number
- B. Decreasing atomic number
- C. Increasing atomic masses
- D. Decreasing atomic masses

Answer: C



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3. In Mendeleev's Periodic Table, gaps were left for the elements to be discovered later. Which

of the following elements found a place in the periodic table later ?

A. Germanium

B. Chlorine

C. Oxygen

D. Silicon

Answer: A



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4. Where would you locate the element with electronic configuration 2,8 in the Modern Periodic tabel ?

A. Group 8

B. Group 2

C. Group 18

D. Group 10

Answer: C



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5. An element which is an essential constituent of all organic compounds belongs to

A. Group 1

B. Group 14

C. Group 15

D. Group 16

Answer: B



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6. Which of the following statements about the Modern Periodic Table is correct?

A. It has 18 horizontal rows known as
Periods

B. It has 7 vertical columns known as
Periods

C. It has 18 vertical columns known as
Groups

D. It has 7 horizontal rows known as
Groups

Answer: C



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7. Which of the following is the outermost shell for elements of period 2?

- A. K shell
- B. L shell
- C. M shell
- D. N shell

Answer: B



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8. Which one of the following elements exhibit maximum number of valence electrons ?

A. Na

B. Al

C. Si

D. P

Answer: D



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9. Which among the following elements has the largest atomic radii?

A. Na

B. Mg

C. K

D. Ca

Answer: C



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10. Which of the following elements would lose an electron easily?

A. Mg

B. Na

C. K

D. Ca

Answer: C



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11. Which of the following elements does not lose an electron easily?

A. Na

B. F

C. Mg

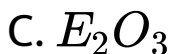
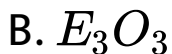
D. Al

Answer: B



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12. What type of oxide would eka-aluminium form?



Answer: C



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13. Three elements B, Si and Ge are

A. Metals

B. non-metals

C. Metalloids

D. metal, non-metal and metalloid

respectively

Answer: C



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14. Which of the following elements will form an acidic oxide?

- A. An element with atomic number 7
- B. An element with atomic number 3
- C. An element with atomic number 12
- D. An element with atomic number 19

Answer: A



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Short Questions

1. How do atoms exist ?



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2. In the modern periodic table which are the metals among the first ten elements.



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3. Define valency and describe its variation in a period and a group



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4. What happens to the metallic character of the elements as we move in a period from left to right in the periodic table? Give reason.



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5. How were the positions of different isotopes decided in modern periodic table?



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6. Where do you think should hydrogen be placed in the Modern Periodic Table?



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7. How were the positions of cobalt and nickel resolved in the Modern Periodic Table?



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8. The two isotopes of chlorine have atomic masses 35 u and 37 u. Should they be placed in the same slot in the periodic table?



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9. Which element is bigger in size, lithium ($Z = 3$) or Sodium ($Z = 11$) and why?



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10. What were the criteria used by Mendeléeey in creating his Periodic Table?



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11. What is called diagonal relationship ?



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12. Name four alkaline earth metals and to which group do they belong?



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13. State two reasons for rejecting law of octaves.



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14. What is the achievement of Doberiner's law of triads ?



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15. How does electronic configuration of atoms change within a period, with increase in atomic number ?



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Long Questions

1. What are the merits and demerits of Newland 's classification?



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2. What happens to atomic radii in a group and period and why ?



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3. What do you mean by Electron affinity ? How it varies in group and periods in modern periodic table?



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4. What do you mean by Electro negativity?



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5. Mendeleev left some gaps in his periodic table.



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Higher Order Thinking Questions

1. Mendeleev treated the hydrides and oxides of element as the basic properties of elements for their classification.



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2. The elements in the same group of the periodic table show close resemblance in their chemical behaviour



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3. The ionization energy of elements increases in a period from left to right



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4. No fixed position could be given to hydrogen in Mendeleev's Periodic table



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5. Three elements A, B and C with similar properties have atomic masses X, Y and Z respectively. The mass of Y is approximately equal to the average mass of X and Z. What is such an arrangement of elements called? Give one example of such a set of elements.



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6. Elements have been arranged in the following sequence on the basis of their

increasing atomic masses. F, Na, Mg, Al, Si, P, S, Cl, Ar, K .

Pick two sets of elements which have similar properties.



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7. Elements have been arranged in the following sequence on the basis of their increasing atomic masses. F, Na, Mg, Al, Si, P, S, Cl, Ar, K .

The given sequence represents which law of classification of elements ?



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8. Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following properties of M and N vary ?

Sizes of their atoms



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9. Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following properties of M and N vary?

Their metallic characters



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10. Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following

properties of M and N vary ?

Their valencies in forming oxides



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11. Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following properties of M and N vary ?

Molecular formulae of their chlorides



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Value Based Question

1. Shyam and Rema are student of Class-X. Shyam is very much organized and maintained. The teachers love him He earns a greater respect in the class whereas Rema is unorganised and always faces a lot of problems in handling life situations.

In your opinion how organisation helps us in daily life?



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