



# CHEMISTRY

## BOOKS - BAL BHARTI

### PERIODIC CLASSIFICATION OF ELEMENTS

**Use Your Brain Power**

1. Chlorine has two isotopes, viz. Cl-35 and Cl-37. Their atomic masses are 35 and 37. Their

chemical properties are same. Where should these be placed in Mendeleev's periodic table?

In different places or in the same place?



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2. Answer the following questions:

Write the molecular formulae of oxides of the following elements by referring to the Mendeleev's Periodic table. Na, Si, C Rb ,P ,Ba, Cl,Sn .



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3. Answer the following questions:

Write the molecular formulae of the compounds of the following elements with hydrogen by referring to the Mendeleev's Periodic table. C, S, Br, As, F, O, N, Cl.



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4. How is the problem regarding the position of cobalt ( ${}_{27}\text{Co}$ ) and nickel ( ${}_{28}\text{Ni}$ ) in

Mendeleev's periodic table resolved in Modern periodic table ?



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5. How did the position of  $\frac{35}{17}Cl$  and  $\frac{37}{17}Cl$  get fixed in the Modern periodic table?

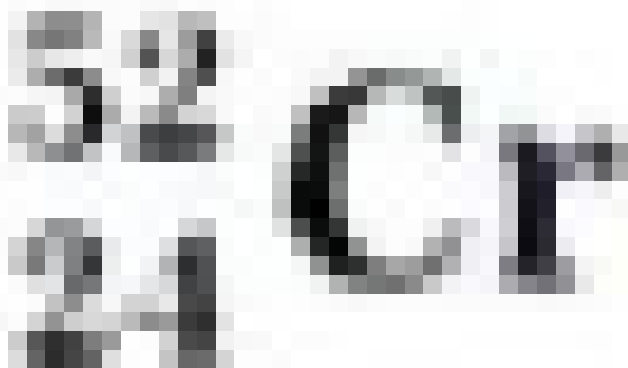


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6. Answer the following questions:

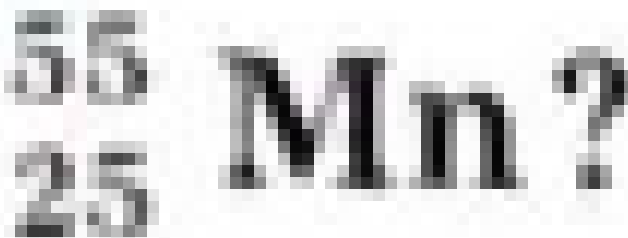
Can there be an element with atomic mass 53

or 54 in between the two elements chromium



and

magnese



?



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7. Answer the following questions:

What do you think? Should hydrogen be placed in the group 17 of halogens or group 1 of alkali metals in the modern periodic table?



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8. Answer the question based on the given data

Elements	K	Na	Rb	Cs	Li
Atomic radius (pm)	231	186	244	262	152

Arrange

the above elements in an increasing order of

atomic radii. Does this arrangement match with the pattern of the group in the above answer?



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**9. Answer the following questions:**

How many elements are there in the second and the third periods of the periodic table ?



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**10.** Which of the above elements have the biggest and the smallest atom?



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**11.** What is the periodic trend observed in the variation of atomic radius while going from left to right within a period?



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**12.** Which of the above elements have the biggest and the smallest atom?



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**13.** What is the periodic trend observed in the variation of atomic radii down a group?



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**14.** Classify the elements of the third period into metals and non-metals.



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**15.** Answer the following questions:

On which side of the period are the metals?

Left or right ?



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**16.** On which side of the period did you find the Non-metals?



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**17.** What is the cause of non-metallic character of element?



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**18.** What is the expected trend in the variation of non-metallic character of element from left to right in a period?



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**19.** What would be the expected trend in the variation of non-metallic character of elements down a group?



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## Exercise

1. Rearrange the columns 2 and 3 so as to match with the column 1:

Column 1	Column 2	Column 3
i. Triad	a. Lightest and negatively charged particle in all the atoms	1. Mendeleev
ii. Octave	b. Concentrated mass and positive charge	2. Thomson
iii. Atomic number	c. Average of the first and the third atomic mass	3. Newlands
iv. Period	d. Properties of the eighth element similar to the first	4. Rutherford
v. Nucleus	e. Positive charge on the nucleus	5. Dobereiner
vi. Electron	f. Sequential change in molecular formulae	6. Moseley



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2. The number of electrons in the outermost shell of alkali metals is \_\_\_\_\_



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3. Alkali earth metals have valency 2. This means that their position in the Modern periodic table is in \_\_\_\_\_



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4. Molecular formula of the chloride of an element X is  $XCl$ . This compound is a solid having high melting point. Which of the following element be present in the same group as X.



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5. In which block of the modern periodic table are the non-metals present?



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6. An element has its electron configuration as 2,8,2. Answer the following questions.

What is the atomic number of this element?



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7. An element has its electron configuration as 2,8,2. Answer the following questions.

What is the group of this element?



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8. An element has its electron configuration as 2,8,2. Answer the following questions.

To which period does this element belong ?



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9. An element has its electron configuration as 2,8,2. Answer the following questions.

With which of the following elements would this element resemble? (Atomic numbers are given in brackets) N(7), Be(4), Ar(18), Cl(17),





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**10.** Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.  ${}_3\text{Li}$ ,  $_{14}\text{Si}$ ,  $_2\text{He}$ ,  $_{11}\text{Na}$ ,  $_{15}\text{P}$ . Which of these elements belong to period 3?



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**11.** Write down the electronic configuration of the following elements from the given atomic

numbers. Answer the following questions with explanation.  ${}_1H, {}_7N, {}_{20}Ca, {}_{16}S, {}_4Be, {}_{18}Ar$ .

Which of these elements belong to the second group ?



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**12.** Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following questions with explanation.  ${}_7N, {}_6C, {}_8O, {}_5B$ , Al. which is the

the most electronegative element among these?



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**13.** Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.



Which is the most electropositive element among these?



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**14.** Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following questions with explanation.

${}_{11}\text{Na}$ ,  ${}_{15}\text{P}$ ,  ${}_{17}\text{Cl}$ ,  ${}_{14}\text{Si}$ ,  ${}_{12}\text{Mg}$ . Which of these has the largest atom?



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**15.** Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following questions with explanation.  $Z = 19$  K,  $Z = 3$  Li,  $Z = 11$  Na,  $Z = 4$  Be. Which of these atoms has smallest atomic radius?



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**16.** Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following questions with

explanation.  ${}_{13}\text{Al}, {}_{14}\text{Si}, {}_{11}\text{Na}, {}_{12}\text{Mg}, {}_{16}\text{S}$ .

Which of the above elements has the highest metallic character?



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**17.** Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following questions with explanation.  ${}_{6}\text{C}, {}_{3}\text{Li}, {}_{9}\text{F}, {}_{7}\text{N}, {}_{8}\text{O}$ . Which of the above elements has the highest non-metallic character?



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**18.** The atom having the smallest size.



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**19.** The atom having the smallest atomic mass .



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**20.** Write the name and symbol of the element from the description.

The most electronegative atom.



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**21.** The noble gas with the smallest atomic radius



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**22.** Write the name and symbol of the element from the description.

The most reactive nonmetal.



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**23.** Write a short note on:

Mendeleev's periodic law



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**24.** Write a short note on:

Structure of the Modern periodic table



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**25.** Write a short note on:

Position of isotopes in the Mendeleev's and the  
Modern periodic table



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**26.** Atomic radius goes on decreasing while going from left to right in a period



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**27.** Give scientific reasons :

Metallic character goes on decreasing while going from left to right in a period



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**28.** Give scientific reasons :

Atomic radius goes on increasing down a group



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**29.** Give scientific reasons :

Elements belonging to the same group have the same valency



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**30.** Give scientific reasons :

The third period contains only eight elements even though the electron capacity of the third shell is 18.



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**31.** Write the names from the description:

The period with electrons in the shells K,L and M.



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**32.** The group with valency zero



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**33.** The family of non-metals having valency one .



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**34.** The family of metals having valency one .



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**35.** The family of metals having valency two



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**36.** The metalloids in the second and third periods



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**37.** Non-metals in the third period .





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**38.** Write the names from the description.

Two elements having valency 4.



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