

QUESTIONS ON "PERIODIC CLASSIFICATION OF ELEMENTS"

Question 1. Table below represents the elements known in 19th century placed in a particular manner-

No.	No.	No.	No.	No.	No.	No.	No.
H 1	F 8	Cl 15	Co & Ni 22	Br 29	Pd 36	I 42	Pt & Ir 50
Li 2	Na 9	K 16	Cu 23	Rb 30	Ag 37	Cs 44	Os 51
G 3	Mg 10	Ca 17	Zn 24	Sr 31	Cd 38	Ba & V 45	Hg 52
Bo 4	Al 11	Cr 19	Y 25	Ce & La 33	U 40	Ta 46	Tl 53
C 5	Si 12	Ti 18	In 26	Zr 32	Sn 39	W 47	Pb 54
N 6	P 13	Mn 20	As 27	Di & Mo 34	Sb 41	Nb 48	Bi 55
O 7	S 14	Fe 21	Se 28	Ro & Ru 35	To 43	Au 49	Th 56

Answer the following questions regarding this table

1. What does this table show
 - (i) If elements are placed in increasing order of their atomic masses, each 8th element show same property as the first element.
 - (ii) If elements are placed in increasing order of their atomic numbers, each 8th element show same property as the first element.
 - (iii) Elements that are placed in same group in above table show same properties.
 - (iv) All the elements are placed randomly they have no similarity in properties
2. What should be the name of the 'law' representing such repetition in the properties of elements?
3. What do you think, why Co & Ni, Ce & La, Di & Mo, Ro & Ru, Ba & V, Pt & Ir are placed in same slot?
4. What are the shortcomings of the table that you notice
 - a. Only elements having mass number upto 56 are placed in the table.
 - b. Iron which resembles cobalt and nickel in properties has been placed far away from these elements.
 - c. This similarity in properties is only applicable till calcium.

Which of the following statements is/ are correct?

- (i) Only (a)
- (ii) (a) and (b)
- (iii) (a), (b), (c)
- (iv) Only (b)

5. At present total 118 elements are known. If it is required to place all the known elements in the same table given, how many more (horizontal) periods are needed ?

Question2. Henry Moseley was an outstanding skilled experiment physicist. In 1913 Moseley celebrated his 26th birthday. Dmitri Mendeleev's periodic table was older. It had been around for 44 years. New chemical elements were still being discovered and added to it.

Since Mendeleev's time, elements in the periodic table had been arranged according to their atomic weights and their chemical properties.

There was , however a basic flaw in the table : the position predicted by an element's atomic weight did not always match the position predicted by its chemical properties. In these cases elements were positioned in the periodic table according to their properties, rather than their atomic weight.

Use the information given in above passage to answer the following questions-

1. Was it possible that elements could have a more fundamental property than atomic weight? If yes, which property is this?
2. What does the atomic number of an element represent?
 - (i) amount of charge in atom's nucleus
 - (ii) number of nucleons in nucleus
 - (iii) number of nucleus
 - (iv) number of neutrons
3. Moseley saw gaps in the new periodic table. He predicted the existence of 4 new elements-
 - (a) technetium
 - (b) promethium
 - (c) hafnium
 - (d) rhenium

Which of the above elements was/were discovered?

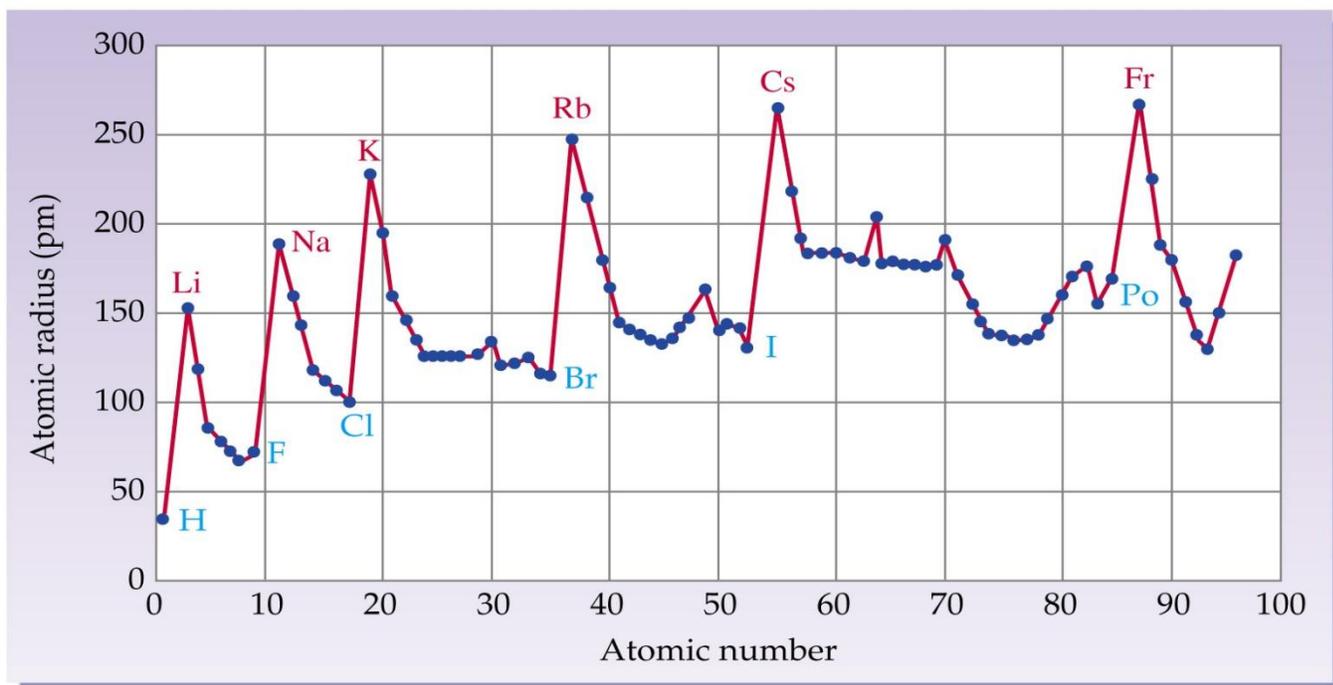
- (i) (a) and (b)
 - (ii) (a) and (c)
 - (iii) (a), (b), (c), (d)
 - (iv) (a), (b), (c)
4. What were the other contributions of Moseley in the field of science?

Question3.

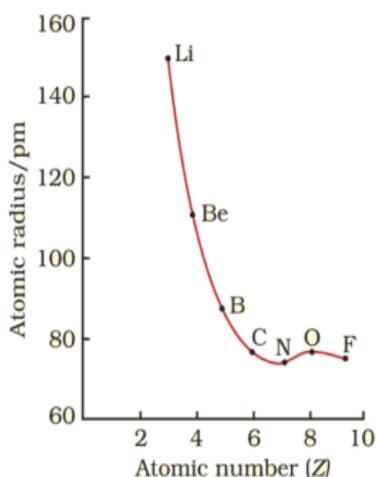
ATOMIC SIZE

The size of atoms is important when trying to explain the behaviour of atoms. The term atomic size refers to the radius of an atom. It is the distance between the centre of nucleus and the outermost shell of an isolated atom.

A graph showing the variation of atomic radius with atomic number for 1st and 17th group of the periodic table is shown below. Observe the graph carefully and answer the following questions-



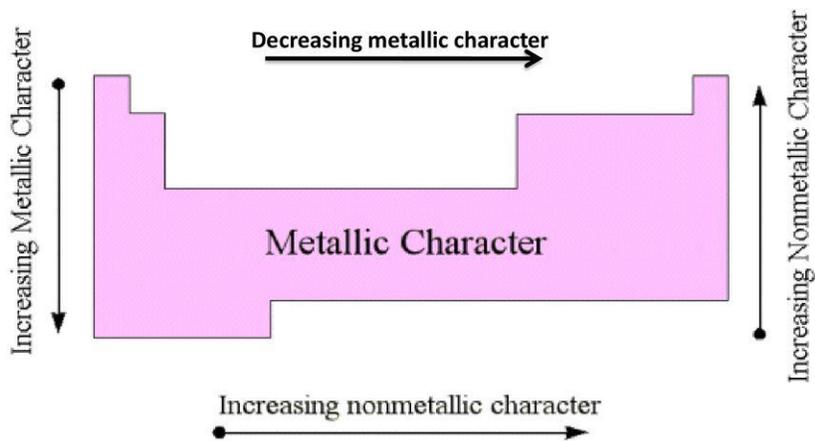
- What does this graph indicate?
 - On increasing the atomic number atomic radii of elements increase
 - On increasing mass number atomic radii of elements increase
 - On going down in a period atomic radii of elements increase
 - On going down in a group atomic radii of elements decreases
- Atomic number of F is 9, while that of Li 3 even then atomic radius of Li is greater than F why?
- In the given graph atomic radius of O is greater than N, is it true? Explain.



4. Arrange the following elements in increasing order of their radius-
H, Na, Ca, Cl, I, O, C, Ne.
5. How does the radii of inert gases vary in a period?

Question4.

Metallic & Non metallic properties



General trends for the metallic character of an element
(metallic character is the *opposite* of nonmetallic character)

In the view of the above diagram , answer the following questions-

1. Non metals are electronegative. Correct order of electronegativity of N,O,F and P is
 - (i) $F > O > P > N$
 - (ii) $F > O > N > P$
 - (iii) $N > O > F > P$

- (iv) $F > N > P > O$
- Write the following oxides in decreasing order of their basic nature-
 Na_2O , Al_2O_3 , MgO ,
 - Write the following in increasing order of their metallic character-
B, Be, Li
 - The element in periodic table which has highest tendency to accept an electron-
 - bromine
 - iodine
 - chlorine
 - nitrogen
 - Which of the following halogen acids is least acidic-
 - HI
 - HCl
 - HF
 - HBr

Question 5. Hydride is the product when hydrogen reacts with any other element. Table below shows the hydrides of elements in the periodic table. On the basis of the table answer the following questions-

(1) 1A	(2) 2A		(13) 3A	(14) 4A	(15) 5A	(16) 6A	(17) 7A	(18) 8A
LiH 692	BeH ₂ d 250		B ₂ H ₆ -165	CH ₄ -182	NH ₃ -78	H ₂ O 0	HF -83	
NaH d 800	MgH ₂ d 280		AlH ₃ d 150	SiH ₄ -185	PH ₃ -134	H ₂ S -86	HCl -115	
KH d	CaH ₂ 816		GaH ₃ -15	GeH ₄ -165	AsH ₃ -116	H ₂ Se -66	HBr -88	
RbH d	SrH ₂ d 675		InH ₃ (?)	SnH ₄ -146	SbH ₃ -88	H ₂ Te -51	HI -51	
CsH d	BaH ₂ d 675		TlH ₃ (?)	PbH ₄	BiH ₃	H ₂ Po	HAt	

- What is the valency of the element 'B' lying in 13th group, 2nd period?
- What is the valency of elements lying in 18th group?
 - 0
 - all have 8 valency
 - 2,8
 - all have valency 2
- Choose the most correct statement
In a period-
 - From left to right valency of elements increases
 - From left to right valency of elements decreases
 - On going from left to right valency of elements increases till 14th group and then decreases
 - On going from left to right valency of electrons increases from 1st to 14th group (excluding elements lying between 2nd to 13th group) and then decreases to 18th group.
- Which statement for the elements lying between 2nd to 13th group is true?
 - These elements show variable valency

- (b) All these elements are metals.
- (c) These elements are colourful
- (d) These elements have a definite valency
- (i) only (a)
- (ii) only (d)
- (iii) (a), (b), (c)
- (iv) All of the above

5. An element has atomic number 24. In which group does it lie?

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