ARJUNA NEET BATCH

CLASSIFICATION OF ELEMENTS & PERIODICITY IN PROPERTIES

DPP-01

Mendeleev's periodic table is based on :-

(A) Atomic number ×

(B) Increasing order of number of protons → Atomic no.

(C) Electronic configuration → Atomic no.

(D) None of the above

According to Mendeleev's, the properties of elements are periodic function of their atomic weights

Which of the following is/are Dobereiners triad? → groups of 3 elements

(a) P, As, Sb
(b) Cu, Ag, Au
(c) Fe, Co, Ni
(d) S, Se, Te

Correct answer is :-

(A) a and b ✗
(B) b and c ✗
(C) a and d
(D) All ✗

Dobereiner's triad : The atomic mass of central atom is arithmetic mean of atomic masses of other two elements

① Li 7
Na 23
K 39

Atomic mass of Na = $\frac{7+39}{2} = 23$ (Arithmetic mean of Li and K.)

② Ca, Sr, Ba , ③ Cl, Br, I

Nowadays some more triads have been made.

(1) K, Rb, Cs

(2) P, As, Sb

At. mass of As = $\frac{m_P + m_{Sb}}{2} = \frac{31 + 120}{2} = 75.5$

(3) S, Se, Te

At. mass of Se = $\frac{m_S + m_{Te}}{2} = \frac{32 + 127}{2} = 79.5$

(4) H, F, Cl

(5) Sc, Y, La.

(c) Fe, Co, Ni

At. mass of Co = $\frac{56 + 58.6}{2}$

= 57.3

But At. mass of Co = 59

X

(b) Cu, Ag, Au

At. mass of Ag = $\frac{63.5 + 197}{2}$

= 130.28

But At. mass of Ag = 107.8

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Which of the following sets of elements follows Newland's octave rule?

(A) Be, Mg, Ca
(B) Na, K, Rb
(C) F, Cl, Br
(D) B, Al, Ga

The elements were classified in order of increasing atomic mass and Newland's noticed that every 8th element have properties similar to 1st. element
It is applicable upto calcium only.

Li° Na K
Be Mg Ca → similar properties, follow octave rule.
B Al°
C Si°
N P
O S
F Cl

Which are correct match?

(a) Eka silicon – Be ✗ Ge

(b) Eka aluminium – Ga ✓

(c) Eka manganese – Tc ✓

(d) Eka scandium – B ✗

(A) b, c

(B) a, b, d

(C) a, d

(D) All

Mendeleev's predicted some of the undiscovered element. He left a gap and named them by placing prefix eka before the name of the element present above the gap.

(Ga) Gallium → Eka aluminium → Gallium is placed below Al.

(Ge) Germanium → Eka silicon.

(Tc) Technetium → Eka manganese.

Phosphorous

Antimony

Atomic wt. of P is 31 and Sb is 120. What will be the atomic wt. of As, as per Dobereiner's triad rule?

Arsenic

(A) 151 ✗

(B) 75.5

(C) 89.5 ✗

(D) Unpredictable ✗

At. mass of As = Arithmetic mean of P and Sb

$$= \frac{31 + 120}{2}$$

$$= \boxed{75.5}$$ Ans.

The places that were left empty by Mendeleev's were, for:-

(A) Aluminium & Silicon
(B) Gallium and germanium
(C) Arsenic and antimony
(4) Molybdenum and tungsten

Gallium → Eka aluminium

Germanium – Eka silicon.

The law of triads is applicable to

(A) Os, Ir, Pt → Osmium, Iridium

(B) Ca, Sr, Ba

(C) Fe, Co, Ni

(D) Ru, Rh, Pt → Platinum, Rhodium, Ruthenium

(1) Li, Na, P

(2) Ca, Sr, Ba → $\frac{40 + 137}{2} = 88.5$ → At. mass of Sr (At. mass of Ca, At. mass of Ba)

(3) Cl, Br, I

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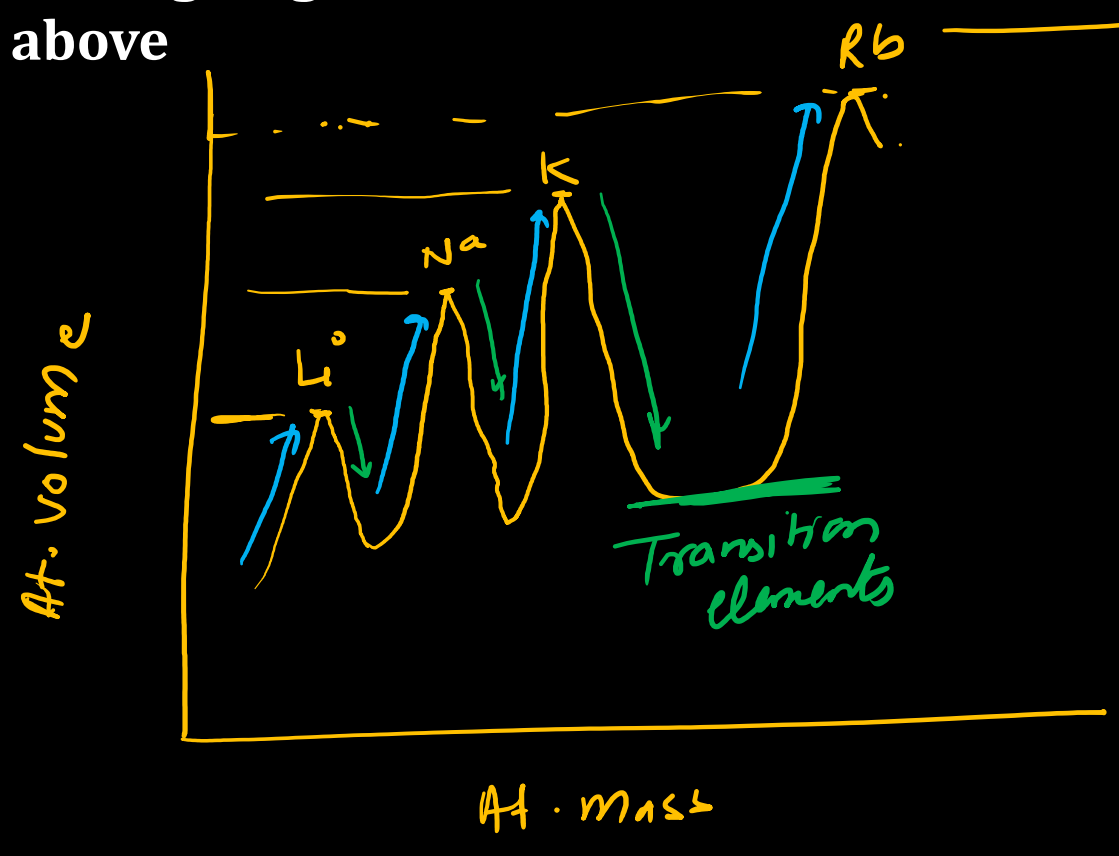
Elements which occupied position in the Lothar Meyer curve, on the peaks, were:

(A) Alkali metals
(B) Highly electropositive elements
(C) Elements having large atomic volume
(D) All of the above



Group-1 elements
Alkali metals
Highly electropositive → because they can easily give 1 electron.

$Na \longrightarrow Na^+ + e^-$

↓
large at. volume

Ascending order : Halogens
Descending order → Group 2 elements → Alkaline earth metals.

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Which of the following element was absent in the Mendeleev's periodic table?

(A) Tc
(B) Si
(C) B
(D) F

Missing / Absent elements in Mendeleev's Periodic Table

(Ge) Germanium → Eka silicon

(Ga) Gallium → Eka aluminium

(Tc) Technetium → Eka manganese.

Which group was added in Mendeleev's periodic table?

(A) I group
(B) VIII group
(C) Zero group
(D) V group

When Mendeleev's periodic table was given, noble gases were not discovered. When they were discovered, they all were placed in separated group named as Zero group.

Thank You