

CHAPTER 4

SLO BASED Quest

Q1: Define group & periods with example?

Group:

Vertical column of elements in the periodic table is called a group or family

Example:

H
Li
Na
K
Rb
Cs
Fr

Explanation

This is the 1st group of the periodic table known as alkali metals.

Period:

Horizontal rows of elements in the periodic table is called period.

Example:

Li Be B C N O F Ne

Explanation:

This is the first period of the periodic table.

Q2: Write electronic configuration, period, group and block for the following:

① Ar₁₈

② He₂

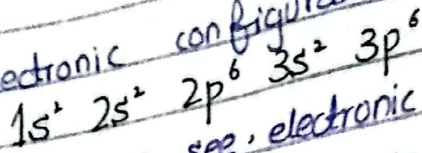
③ Ne₁₀

① Ar₁₈

Electronic Configuration:

As we know, the atomic number of Argon is 18 so

its electronic configuration is:



Period: As we can see, electronic configuration of argon ends at $3p^6$ so period will be: 3^{rd}

Group: No. of valence e^- = Group no. -

$$3s^2, 3p^6 = 2 + 6 = 8$$

So Argon belongs to

Group VIII

Block: Its electronic configuration ends at p subshell so

Block = p

(ii) He_2

Electronic Configuration:

As we know, atomic number of helium is 2 so its electronic configuration is:



Period: As we can see, electronic configuration of helium ends at $1s^2$ so period will be: 1^{st}

Group: No. of valence e^- = Group no. -

$$1s^2 = 2$$

So argon/helium belongs to group VIIIA because valence shell is complete.

Block: Its electronic configuration ends at s subshell so

Block = s

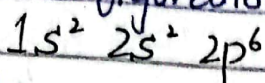
(iii)

Ne_{10}

Electronic Configuration:

As we know,

atomic number of Neon is 10 so its electronic configuration is:



Period: As we can see, electronic configuration of Neon ends at $2p^6$ so period will be: 2nd

Group: No. of valence e = Group no. -

$$2s^2 + 2p^6 = 2 + 6 = 8$$

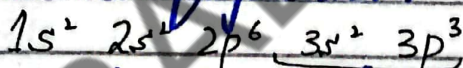
So Neon belongs to Group VIII

Block: Its electronic configuration ends at p subshell so

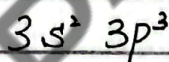
$$\text{Block} = p$$

Q3: Write valence electronic configuration for P_{15}

Electronic Configuration:



Valence Electronic Configuration:



Q4: Which element has greater shielding effect: F or Br.

F and Br are arranged in group. so As you move along group from top to bottom, shielding effect increase.

Hence, we can say:

Flourine has greater shielding effect
 $F > Br$

Reasons:

Here are few reasons:

① Atomic size increases.

- ② Inner shell increase-
- ③ Effective nuclear charge decreases-

Q5: Which element has smaller atomic size:
Na or S.

Na & S are arranged in period so As you move along a period from left to right, atomic size decrease - Hence:

Sulphur has smaller atomic size
 $Na < S$

Reasons:

- Here are a few reasons:
- ① Effective nuclear charge increase-
 - ② Electrons are in same shell.
 - ③ Constant shielding effect.
 - ④ Atomic no. increase-

Q6: Which atom has more Electron affinity:
H or He

He has more Electron Affinity.

Reasons:

- Atomic radius decreases.
- Nuclear attraction increases.
- $E \cdot A$ increases.

Q7: Why alkali metals are soft?

Alkali metals are soft bcz they have low densities. which allows them to cut easily with a knife.

Q8: Differentiate b/w alkali & transition metals?
OR (can be in this form)

Q8: Differentiate b/w s-block/soft & d-block/hard metals-

Alkali/soft/s-block	Transition/d-block/hard
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Definition

Alkali metals are the first group of periodic table.

Element present in d-block (Group III to XII) are called transition metals.

Density

Alkali metals have generally low density.

Transition elements generally possess high densities.

Melting Points

Alkali metals have low melting points.

Transition ~~elemental~~ elements have high melting points.

Blocks

Alkali metals are s-block elements.

Transition metals are d-block elements.

Hardness

Alkali metals are soft.

Transition metals are hard.

Example

H, Li, Na are Alkali metals.

Pt, Fe, W are Transition metals.

Q9: Why Iodine can't oxidize any halide ion?

Iodine is least reactive as there is no element next to it so Iodine can't oxidize any halide ion.

Q10: Why they are called Noble gases? These gases doesn't react with any atoms bcz its valence shell is complete. They are also monoatomic gases.

Q11: Differentiate b/w metals & non-metals

Metals	Non-metals
Nature	
• Metals are electro-positive elements.	• Non-metals are electronegative elements.
Valence shell electron	
• They contain 3 or less than 3 e^- in valence shell	• They contain 4 or more than 4 e^- in valence shell.
Electron gain & lose	
• Metal lose e^- to form cation.	• They gain e^- to form anion.
Position	
• Metals are present on left side.	• Non-metals are present on right side.