

Chemistry - 12th Class Chemistry Chapter 1 Short Questions Preparation

Q1. d and f block elements are called transition elements. Give reasons.

Ans 1: d and f block elements are located in between s and p block elements in the periodic table. Their properties are also in between s and p block elements and they vary from left to the right. It means that their properties show a transition in a systematic way. In d block elements d-d transition occur and elements exhibit colors. Similarly in f block elements d and f orbital show transition of elements hence these are called inner transition elements. That is why they are called as transition elements.

Q2. The oxidation state vary in a period, but remain almost constant in a group. Give reason.

Ans 1: The number of electrons in outermost shells goes on changing in periods from left to the right, So oxidation states go on changing. The number of electrons in the outermost shells remains the same in a group, so the oxidation states remains the same. Anyhow, the process of unpairing of electrons may happen in a group and oxidation states may change.

Q3. M.P and B.P of short periods increase up to middle of period and then decreases. Why?

Ans 1: Melting and boiling points of short periods: Across the short periods, the melting and boiling points of elements increase with the number of valance electrons up to group IVA and then decrease up to the noble gases. The melting points of groups IA element are low because each atom in them provides only one electron to for a bond with other atom. Melting point of group IIA elements are considerable higher than those of group IA elements because each atom in them provides two binding electrons.

Q4. Solution of Na₂O in water is alkaline. Justify the statement.

Ans 1: Alkali metal oxides dissolve in water to give alkaline solutions. For Example:

Na₂O+H₂O----->2NaOH

Ans 2: The reaction of alkali metal oxide with water is an acid-base reaction. The reaction involved the decomposition of water molecule by an oxide ion as:

$$O^{2}$$
+ $H_{2}O$ ---->2 OH^{-}

Q5. What improvements were made in Mendeleev's periodic table.

Ans 1: Mendeleev's periodic law:-Mendeleev's arranged the elements in ascending order of their atomic masses and found that elements with similar properties appeared at regular intervals.

Ans 2: Improvements made in Mendeleev's periodic table: After the discovery of atomic numbers by Moseley in 1911, it was noticed that elements could be classified more satisfactorily by using their atomic numbers, rather than their atomic masses. Hence, the periodic table was improved by arranging the elements in ascending order of their atomic number instead of their atomic masses. This improvement rectified a number of confusions present in the old periodic table.

- Ans 1: Trend of ionization energy in periodic table: In groups ionization energy decrease from top to bottom because size of atom and number of electrons causing the shielding effect also increases.
- **Ans 2:** In period by moving from left to right the outer shell remains the same while the nuclear charge increase effectively that makes the removal of an electron difficult and hence the value of ionization energy increases.
- Q7. How the classification of elements in different blocks help in understanding their chemistry?
 - **Ans 1:** Classification of elements in different blocks help in understanding chemistry of elements and predicting their properties especially the concept of valency or oxidation state.
 - Ans 2: According to this classification elements of IA and IIA subgroups are called s-block elements, because their valence electrons available in s orbital. The elements for IIIA to VIIIA subgroups are known as p block elements as their valence electrons are present in p orbital. Similarly in transition elements, electrons are in d orbital are responsible for their valency hence they are called d-block elements. For Lanthanides and Actinides valence electrons are present in f orbital hence these elements are called f-block elements.
- Q8. Why melting and boiling points of elements belonging to groups VA-VIIA are lower?
 - **Ans 1:** Melting and boiling points of elements belonging to groups VA-VIIA are lower because elements of these groups exist as small,covalent molecules,rather than as three dimensional lattice having very weak intermolecular forces between them. Consequently, their melting and boiling points are extremely low.
- Q9. What is Newland's law of octaves?
 - Ans 1: Newland who was English chemist,in 1864,classified 62 elements,known at that time,in increasing order of their atomic masses. He noted that every eight element had some properties in common with the first one. The principle on which this classification is based was called the law of Octaves.
- Q10. Why metallic character increases from top to bottom in a group of metals?
 - **Ans 1:** Metallic character increases from top to bottom in a group because from top to bottom atomic size of atoms increases and it is easier to remove the electron of an atom bigger in size.