Chemistry - 12th Class Chemistry Chapter 1 Short Questions Preparation

Q1. Ionization energy increases from left to right in a period.Justify the statement.

Ans 1: 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.

Q2. Solution of Na_2O in water is alkaline.Justify the statement.

Ans 1: Alkali metal oxides dissolve in water to give alkaline solutions.For Example:
Na_2O+H_2O----------->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:
$O^{2-}+ H_2O$ -------->$2OH^-$

Q3. Discuss the trend of inoization energy in 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.

Q4. What is lanthanide contraction?

Ans 1: **Lanthanide contraction**:The atomic number increases from left to right,the atomic radius decreases,This gradual decrease in the radius is due to increase in positive charge in the nucleus.As the positive charge increases,the negatively the outer most shell becomes gradually smaller.This effect is quite remarkable in the elements of longer periods in which d and f subshells are involved.For example the gradual reduction in the size of Lanthanides is significant and called Lanthanide Contraction.

Q5. 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.

Q6. Define modern periodic table.

Ans 1: **Modern periodic table**:The table of elements in which all the elements are arranged in ascending order of their atomic numbers having seven periods and eighteen groups is called modern periodic table.

Q7. Describe 7^{th} period of modern periodic table.

Ans 1: This period is incomplete.This contains only two normal elements Fr and Ra,ten transition elements and fourteen inner transition elements.The inner transition elements of this period are called Actinides,as they starts after Ac(Actinium).The actinides are also shown at the bottom of the periodic table under the Lanthanides. Due to their scarcity,the inner transition elements are also called Rare Earth Elements.

Q8. 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.

Q9. 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.

Q10. Why the oxidation state of noble gases is usually zero?

Ans 1: Group VIII A elements,which are also called zero group elements usually show zero oxidation state because there is no vacancy in their outer most shell to accommodate more electrons.
