CHEMISTRY

CHARACTERISTICS OF TRANSITION ELEMENTS

✓ INTERMEDIATE AND APTITUDE TEST LEVEL NOTES

1- Variable Oxidation State:

Transition elements show variable oxidation state because transition metals have empty (n-1) d orbitals that are closer to the outermost ns orbital means these orbitals have similar energy. These (n-1) orbitals are generally not fully filled like in 1st series only zinc has fully filled d-orbitals. So, they take part in the formation of cations

Let's consider a transition metal, Fe. The atomic number of Fe is 26. Hence it has the electronic configuration

$[Ar]3d^6 4s^2$

It shows oxidation states from +2 to +6 To show +2 oxidation state it loses two electrons from the outer 4s orbital and to show +3 to +6 oxidation state electrons can be removed from the unpaired d-orbitals. Highest oxidation state belongs to Mn i.e +7

2- Magnetic Property:

The ability of an atom to attract in electrical or magnetic field due to presence of unpaired electrons is called paramagnetism. As many of transition elements like Fe, Co , Mn , Ni have unpaired electrons in d-orbital hence they are paramagnetic.

On the other hand zinc has all paired electrons is d-orbital hence not show paramagnetic property and repel in magnetic and electrical field called Diamagnetic.

3- Catalytic Property:

A Catalyst is a substance that can increase or decrease rate of reaction without consuming during the reaction. Many transition elements and their compounds are used as catalyst as in some cases they form unstable intermediates which cause