**Mechanism of co-ordination Polymerization**

Co-ordination polymerization is carried out in the presence of Zeigler natta catalyst. This catalyst is Titanium tri-chloride or Titanium tetra- chloride in Hexane solution of tri ethyl Aluminum. This catalyst is a combination of Transition metal chloride and organo- metallic compound. The structure of catalyst is as follows-

Cl

Cl Ti (C2H5)3Al

Cl

In this catalyst a co-ordinate bond is formed between the transition metal titanium and ethyl carbon atom. The transition metal will be always electropositive because it always has various vacant orbital.

This polymerization is carried out in three steps-

**Initiation**- In the initiation step the monomer having a unsaturated bond is reacted with catalyst. The monomer is inserted between the Ti metal and ethyl carbon atom to form a monomer catalyst complex.

Cl Cl Cl

Cl Ti (C2H5)3Al + CH2=CH2 Cl Ti CH2-CH2-(C2H5)3Al

Cl monomer monomer catalyst complex

**Propogation**- In this step ‘n’ numbers of monomers are further added between the Ti metal and C-atom to form a long chain polymer.

Cl Cl Cl Cl

Cl Ti CH2-CH2-(C2H5)3Al + nCH2=CH2 Cl Ti [CH2-CH2-]n-(C2H5)3Al

**Termination**-The termination is done by reacting the monomer catalyst complex with a compound HX, where X is a halogen.

Cl Cl Cl Cl

Cl Ti [CH2-CH2-]n-(C2H5)3Al + HX Cl Ti X + H [CH2-CH2-]n-(C2H5)3Al

The co-ordination polymerization is also called Stereospecific polymerization because it determines the orientation of side groups during polymerization. This polymerization is used in the manufacturing of Polypropylene and high density polymerization.