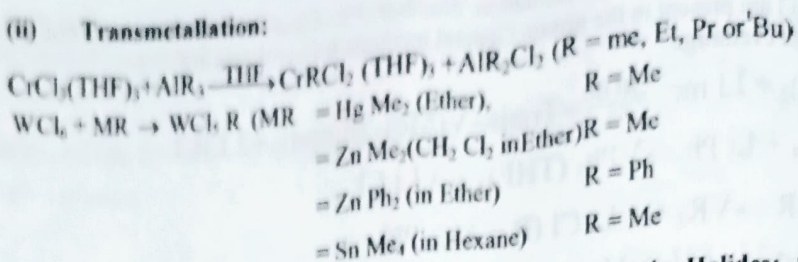
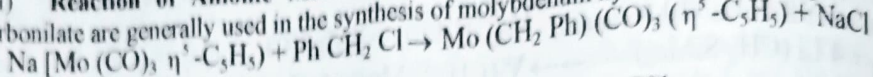


Transition Metal - Aryl & Alkyl Complexes

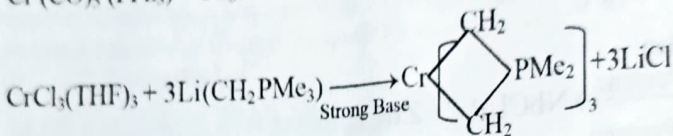
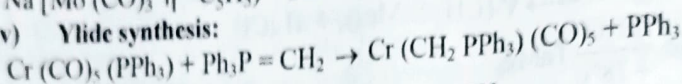
(ii) **Transmetallation:**



(iii) **Reaction of Anionic Metal Complexes with Organic Halides:** Sodium salts of carbonylate are generally used in the synthesis of molybdenum hydrocarbyls. Example:



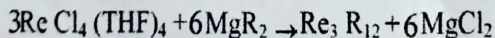
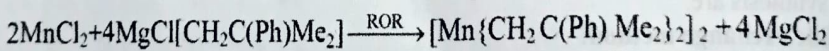
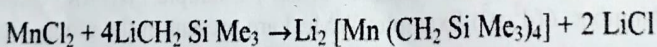
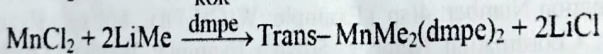
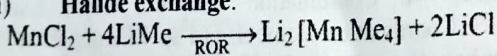
(iv) **Ylide synthesis:**



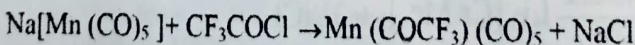
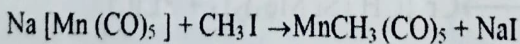
5. **Group 7 - d⁵ Metals:** Mn [Oxidation Number +1: Coordination Number: 6(d²sp³) Example: Mn(CF₃)(CO)₅; Oxidation Number +2: Coordination Number: 4(sp³) Example: MnMe₂(dmpe)₂; Oxidation Number +3: Coordination Number: 4(sp³) Example: [Mn(CH₂CMe₂PPh₃)₃]₂] and Re [Oxidation Number +3: Coordination Number: 4(sp³) Example: Re₂(μ-SiMe₃)₂(CH₂SiMe₃)₄, 6(d²sp³) Example: Re₂Me₈²⁻; Oxidation Number +4: Coordination Number: 6(d²sp³) Example: Re₃(CH₂SiMe₃)₁₂; Oxidation Number +6: Coordination Number: 6(d²sp³) Example: ReMe₆] are present in the group.

General methods for synthesis are:

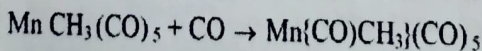
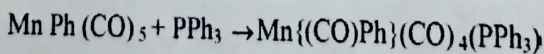
(i) **Halide exchange:**



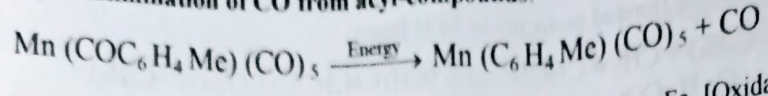
(ii) **Reactions of anionic metal complexes with organic halides:**



(iii) **Insertion of unsaturated compounds in M-C bond:**

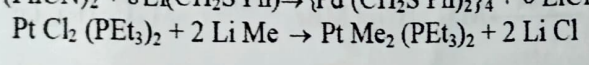
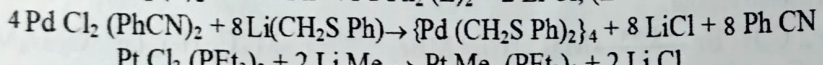
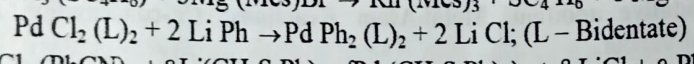
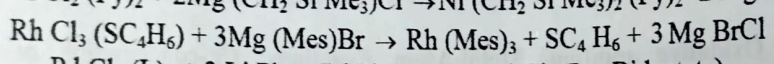
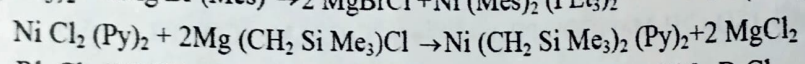
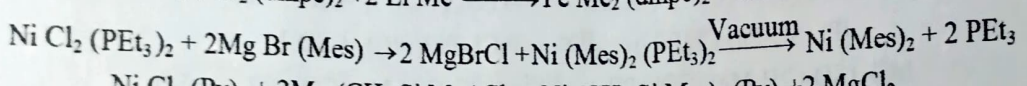
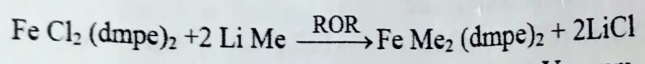


(iv) Elimination of CO from acyl-compounds

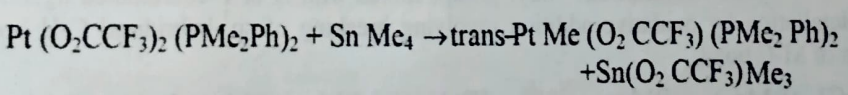
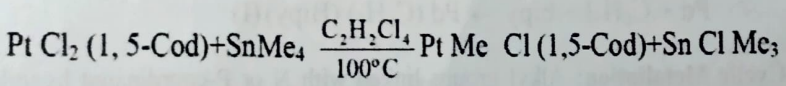
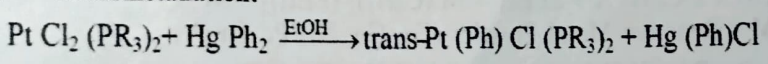


6. Group 8, 9, 10 - d^6 , d^7 , d^8 Metals, respectively: Fe [Oxidation Number +2: Coordination Number: 2(sp) Example: $\text{Fe}(\text{Mes})_2 \text{MeS}$ = Mesitylene, $4(sp^3)$ Example: $\text{FePh}(\text{Co})_2(\eta^1\text{-C}_5\text{H}_5)$], Co [Oxidation Number +1: Coordination Number: 5(dsp^3) Example: $\text{Co}(\text{CF}_2\text{CF}_2\text{H})(\text{CO})_4$; Oxidation Number +2: Coordination Number: 4(sp^3) Example: $[\text{CoPh}_2(\eta^6\text{-C}_6\text{H}_4\text{Me})]$, 6(d^2sp^3) Example: $[\text{Co}(\text{C}=\text{CR})_6]^{3+}$; Oxidation Number +4: Coordination Number: 4(sp^3) Example: CoR_4 , 6(d^2sp^3) Example: $[\text{Co}(\text{CH}_2\text{Ph})(\text{CN})_5]^{2-}$], Ni [Oxidation Number +2: Coordination Number: 2(sp) Example: NiBu_2 , 4(sp^3) Example: NiMe_4^{2-} ; Oxidation Number +3: Coordination Number: 3(sp^2) Example: $[\text{Ni}(\text{CH}_2\text{Ph})(\text{CN})_5]^{2-}$], Ru [Oxidation Number +4: Coordination Number: 6(d^2sp^3) Example: $[\text{Ni}(\text{CH}_2\text{Ph})(\text{CN})_5]^{2-}$], Rh [Oxidation Number +3: Coordination Number: 3(sp^2) Example: $\text{NiPh}_2(\eta^6\text{-C}_6\text{H}_4\text{Me})$, Oxidation Number +2: Coordination Number: 6(d^2sp^3) Example: $[\text{Ni}(\text{CH}_2\text{Ph})(\text{CN})_5]^{2-}$], Ru [Oxidation Number +3: Coordination Number: 6(d^2sp^3) Example: $\text{Ru}(\text{CH}_3)(\text{I})(\text{CO})_2(\text{PPh}_3)_2$], Rh [Oxidation Number +3: Coordination Number: 3(sp^2) Example: $\text{Rh}(\text{Mes})_3$, 6(d^2sp^3) Example: $[\text{Rh}(\text{Et})(\text{NH}_3)_5]^{2+}$], Pd [Oxidation Number +2: Coordination Number: 4(sp^3) Example: $[\text{Pd}(>\text{CH}_2\text{SPh})_2]_4$], Ir [Oxidation Number +3: Coordination Number: 6(d^2sp^3) Example: $\text{IrMe}(\text{Cl})(\text{I})(\text{CO})(\text{PPh}_3)_2$], Pt [Oxidation Number +2: Coordination Number: 4(dsp^2) Example: $\text{PtMe}_2(\text{PPh}_3)_2$] etc. are present here. General methods for synthesis are:

(i) Halide exchange:



(ii) Transmetallation:



(iii) Reaction of anionic metal complexes with organic halides:

