Organometallic Chemistry

Schedule:

Week 1: A brief history of the development of organometallic chemistry. Definition, classification and general characterization of organometallic and main group organic compounds.

Week 2: General characterization of main group organometallics. General methods for the preparation of organometallic compounds.

Week 3: Ionic (polar) organometallic compounds.

Week 4: Electron-deficient organometallic compounds; organolithium and organoberyllium compounds.

Week 5: Organomagnesium, -boron and -aluminum compounds.

Week 6: Organosilicon compounds and silicones. Other covalent main group organic compounds.

Week 7: General characterization of organometallic compounds of the d block elements. Organometallic compounds with η^1-(σ-donor) ligands; coupling and cross-coupling reactions (Heck, Negishi, Suzuki reaction).

Week 8: Transition metal carbonyls and their applications (carbonylation reactions, Monsanto process for acetic acid synthesis, hydroformylation of alkenes).

Week 9: Transition metal-alkenes and their applications (Wacker process). Transition metal-alkyne complexes.

Week 10: Transition metal-allyl and -cyclopropenyl complexes.

Week 11: Transition metal complexes of η^4-ligands (butadiene and cyclobutadiene).

Week 12: η^5-(cyclopentadienyl) complexes of transition metals.

Week 13: η^6–η^8 transition metal complexes of C_6H_6, $C_7H_7^+$ and $C_8H_8^{2-}$ ligands.