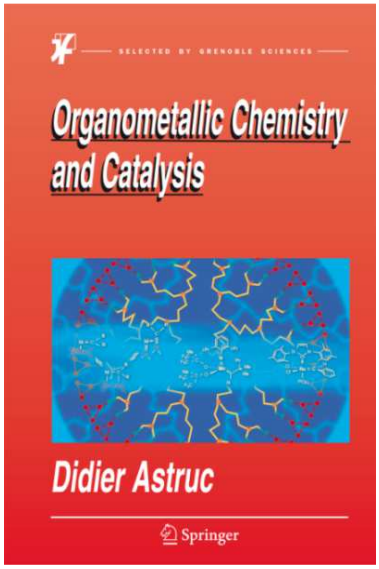
Reading list KJEM243 Organometallic Catalysis/ Litteraturlist KJEM243 Metallorganisk katalyse

1. Textbook/Bøker (kan lånes på biblioteket eller kjøpes av studenten)

D. Astruc. (2007). *Organometallic Chemistry and Catalysis*. Grenoble: Springer. (ISBN 978-3-540-46128-9)



2. Can be bought from Literature kiosk /Kan kjøpes i litteraturkiosken.uib.no

Articles/Artikler

Malcolm L. H. Green & Gerard Parkin (2016). The classification and representation of main group element compounds that feature three center four-electron interactions. *Dalton Transactions*, *45*, 18784-18795. DOI: 10.1039/c6dt03570a

Jennifer C. Green, Malcolm L. H. Green and Gerard Parkin (2012). The occurrence and representation of three-centre two-electron bonds in covalent inorganic compounds. *Chemical Communication*, *48*, 11481–11503. DOI: 10.1039/c2cc35304k

4. Materials free of charge available on internet/Materiale som ligger fritt tilgjengelig på nettet

R. Toreki (2016, 15. august). Organometallic HyperTextBook (http://www.ilpi.com/organomet/index.html)

KJEM243 Metallorganisk Katalyse
KJEM243 Organometallic Catalysis

PART-1

I Introduction to the Organometallic Chemistry (Chap 1)
I-1 History (P5-20)
I-2 Definition
I-3 Nomenclature (UIPAC document)
I-4 Crystal-field theory
I-5 Ligand-field theory

II General Properties of OM complexes (Chap 1)
II-1 18-electron rule (P32 + P37-41)
II-2 Electron counting and oxidation state (P32-34)
II-3 Common ligands and their electrons counts (P23-31)
II-4 Limitation of 18-electron rule (P37-41)
II-5 Coordination number and geometry (P34-37)

III Fundamental Reactions in Organometallic Chemistry (9) (Chap 4, 5, 6 and 21)
III-1 Non Oxidative Addition/Associative Mechanism (P123-126)
III-2 Non Reductive Elimination/Dissociative (P121-122)
III-3 Oxidative Addition (P87-95)
III-4 Reductive Elimination & ◎-Bond Metathesis (P95-97)
III-5 Oxidative Coupling (P103-105)
III-6 Reductive Cleavage (P103-105)
III-7 Insertion Reactions- Alkyl Migration (P135-143)
III-8 Extrusion –α, β, γ and δ Elimination (P143-145)
III-9 Ligands X Substitution/Modification & transmetallation (P132-133 + P499-509 + P513-515)

PART-2

IV Bonds to Metals Complexes and Catalysis (Chap 7, 8, 9, 10, 11, 14, 15, 16, 18 and 21)
IV-1 Metal-Alkene/Alkyne (P225-228, 231-233)
Wacker Process (P396-211)
Nicholas reaction
Reppe Reaction & hydroxycarbonylation (P435-436)
Pauson-Khand (P519-521)
IV-2 Metal-Carbonyl (P151-162)
Water Gas Shift (P469-471)
Monsanto/Cativa (P431-432)
IV-3 Metal-Phosphine (P168-170)
IV-4 Metal-Alkoxide/Amido (P193)
IV-5 Metal-Amine/Nitrogen (P164-166)
IV-6 Metal-Allyl/Diene (P228-231 + 233-237)
IV-7 Metal-Cyclopentadienyl/Arene (P237-247 + 252-278)
Green-Davis-Mingos rules (P109-114)
IV-8 Metal-Hydride (P184-192)
Hydrogenation (P357-361)
Hydroformylation (P491-434)
Hydroelementation (P361-362 + 363)
Hydrocyanation (P362-363)
IV-9 Metal-Alkyl (P175-184)
Polymerization (P367-373)
SHOP (P386-389)
IV-10 Metal-Ligand Multiple Bonds (P197-222)
Olefin metathesis (P373-384)

V Surface and Supported Organometallic and Heterogeneous Catalysis (Chap 20)