

Contents

I. Introduction	1
II. Historical	2
III. Bonding theories	5
IV. General methods of preparation	14
1. $(\text{olen})_m\text{MX}_n$	14
a) Reaction of a metal salt or a complex salt with an oligo-olefin	14
α) without solvent	14
β) in water	15
γ) in an organic medium	15
b) Displacement reactions	16
2. $(\text{olen})_m\text{MX}_n\text{L}_x$	17
3. $(\text{olen})_m\text{M}(\text{CO})_n$	17
4. $(\text{olen})_m\text{M}(\text{CO})_{n-1}\text{L}$	20
5. $(\text{dien})\text{MC}_5\text{H}_5(\text{CO})_n$	20
6. $(\text{olen})\text{MC}_n\text{H}_n$	21
7. $(\text{olen})_m\text{M}$	23
V. General discussion of preparative results	25
1. Cyclobutadiene-metal complexes	25
2. Cyclopentadiene-metal complexes	36
3. Fulvene-metal complexes	45
4. Cyclopentadienone-metal complexes	49
5. Heterocyclopentadiene-metal complexes	60
6. Cyclohexa-1,3-diene-metal complexes	63
7. Quinone-metal complexes	73
8. Norbornadiene-metal complexes	81
9. Cyclohepta-1,3,5-triene-metal complexes	88
10. Cyclohepta-1,3-diene-metal complexes	104
11. Azulene-metal complexes	105
12. Cyclo-octadiene-metal complexes	112
13. Cyclo-octatetraene-metal complexes	119
14. Metal complexes with olefins C_8H_{10}	136
15. Metal complexes with olefins C_9H_{10} and C_9H_{12}	143
16. Cyclododeca-1,5,9-triene-metal complexes	148
17. Acenaphthylene-metal complexes	150
18. Dipentene-metal complexes	151
19. Dicyclopentadiene-metal complexes	152
20. Buta-1,3-diene-metal complexes	155

21. Pentadiene-metal complexes	168
22. Hexadiene-metal complexes	171
23. Metal complexes with non-cyclic triolefins	173
VI. Metal complexes with π-allylic ligands	176
1. Introduction	176
2. Structural investigations	177
a) NMR measurements	177
b) Infrared measurements	180
c) Ultraviolet measurements	182
d) X-ray investigations	182
e) Dipole measurements	185
3. Summary of bonding theory	187
4. Preparative methods	188
5. Preparative details	189
a) Titanium	189
b) Chromium	189
c) Molybdenum	190
d) Tungsten	191
e) Manganese	191
f) Rhenium	193
g) Iron	194
h) Ruthenium	198
i) Cobalt	198
j) Rhodium	204
k) Nickel	205
l) Palladium	209
m) Platinum	218
References	219
Register of Compounds	233