课程名（Coursename）
Main Group Organometallics

课程代码（Coursenumber）
M9

课程对象（Audience）
Graduates

开课教师（Teacher）
Dr A. E. H. Wheatley and Dr F. Garcia

学期（Semester）

课程描述（Description））
Many main-group metallated organic compounds find applications both as large-scale industrial chemicals and as important reagents in organic sytheses. This course will examine in detail the fundamental chemistries of main-group organo-metallics. Modern bonding theories will be used to describe the interactions they form and to explain the diversity of their structures. The extent to which electron counting schemes can rationalise the structures of these molecules will be a common theme. Students would benefit from having done the Rings, chains and networks course at Part II
Topics s-block metals – Synthesis, structure and bonding of systems containing s-block metals, especially lithium, with organic ligands. The concepts of ‘ring stacking’ and ‘ring laddering’ will be used to rationalise and predict structures. p-block metals – The greater covalency in compounds of p-block elements, compared to s-block elements, is manifested in the structures of the organometallics. Molecular orbital treatments of key compounds will be used to understand structures. The accessibility of various oxidation states and the stabilization of low oxidation state metals, such as Al(I), using particular ligand sets will also be discussed. Main group rings, chains and cages as ligands in organometallic chemistry – The synthesis, bonding, structural diversity and reactivity of organometallic complexes containing catenated main group ligands will be discussed. The ligands to be dealt with include boranes (which give metalloboranes on coordination), carboranes (which give metallocarboranes), ‘naked’ main group ligands, such as Pn (n = 2 – 10), Sn and cyclic ligands such as (RE)n (E = P, As; n = 3 – 6). It will be shown that the transition metal-catalysed making and breaking of bonds within main group ligands can lead to new heterocyclic ligands which are inaccessible by other means.

课时信息（Totalhours）

教参信息（Textbookinfo）
1 Organometallic Chemistry by Gary O. Spessard and Gary L. Miessler (Hardcover - Oct. 26, 2009)
ISBN-13: 978-0195330991
世界各地拥有馆藏的图书馆（OCLC）:116
2 The Organometallic Chemistry of the Transition Metals by Robert H. Crabtree (Hardcover - Apr. 6, 2009)
ISBN-13: 978-0470257623
世界各地拥有馆藏的图书馆（OCLC）:162
3 Organotransition Metal Chemistry: From Bonding to Catalysis by John Hartwig (Hardcover - Nov. 30, 2009)
ISBN-13: 978-1891389535
世界各地拥有馆藏的图书馆（OCLC）:136
4 Applied Organometallic Chemistry and Catalysis (Oxford Chemistry Primers) by Robin Whyman (Paperback - Sept. 6, 2001)
ISBN-13: 978-0198559177
世界各地拥有馆藏的图书馆（OCLC）:221
5 Organometallics by Christoph Elschenbroich (Paperback - Apr. 28, 2006)
ISBN-13: 978-3527293902
世界各地拥有馆藏的图书馆（OCLC）:398
6 Organometallic Chemistry and Catalysis by D. Astruc (Hardcover - Sept. 26, 2007)
ISBN-13: 978-3540461289
世界各地拥有馆藏的图书馆（OCLC）:133
7 Applied Organometallic Chemistry and Catalysis (Oxford Chemistry Primers) by Robin Whyman (Paperback - Sept. 6, 2001)
ISBN-13: 978-0198559177
世界各地拥有馆藏的图书馆（OCLC）:221
8 Introduction to Coordination Chemistry (Inorganic Chemistry: A Textbook Series) by Geoffrey A. Lawrance (Paperback - Mar. 1, 2010)
ISBN-13: 978-0470519318
世界各地拥有馆藏的图书馆（OCLC）:111
9 Advances in Organometallic Chemistry, Volume 58 by Anthony F. Hill and Mark J. Fink (Hardcover - Dec. 15, 2010)
ISBN-13: 978-0123747846
世界各地拥有馆藏的图书馆（OCLC）:3
10 Organometallic Chemistry (SPR Organometallic Chemistry) by E.W. Abel (Hardcover - July 1, 2010)
ISBN-13: 978-0851867113
世界各地拥有馆藏的图书馆（OCLC）:9
11 Organometallic Chemistry (SPR Organometallic Chemistry) by E.W. Abel and F. G. A. Stone (Hardcover - June 1, 2010)
ISBN-13: 978-0851865515
世界各地拥有馆藏的图书馆（OCLC）:4
12 Sol-Gel Materials: Chemistry and Applications (Advanced Chemistry Texts) by John D. Wright and Nico A.J.M. Sommerdijk (Hardcover - Dec. 21, 2000)
ISBN-13: 978-9056993269