

Course Code & Title : **CM4022 Main-Group Chemistry**

Academic Units : 3 AU

Pre-requisite : CM2021 or by permission

Course Description :

CM4022 Main-Group Chemistry

[Lectures: 39 hours; Pre-requisites: CM2021 or by permission; Academic Unit: 3]

Learning Objective

To learn the principles of main-group (*s* and *p* block) element chemistry with an emphasis on synthesis, structure, bonding, and reaction mechanisms.

To study organometallic chemistry of main-group elements.

Content

This course covers the principles of main group (*s* and *p* block) element chemistry with an emphasis on synthesis, structure, bonding, and reaction mechanisms.

Course Outline

S/N	Topic	Lecture Hours
1	Structure and Bonding in Main-Group Chemistry	3
2	Acid-base Chemistry: Frustrated Lewis Pairs	3
3	Group 1 Elements: Organolithium Compounds	3
4	Group 2 Elements: Hydroamination	3
5	Boron: Transition-metal Stabilized Borylene and Boryllithium	3
6	Aluminum Metalloid	3
7	Aluminum(I) Chemistry	3
8	Multiple Bond	3
9	Low-valent Group 14 Element Chemistry	3
10	Silicon: From Molecules to Materials	3
11	Nitrogen Activation by Transition-Metal Complexes	3
12	Carbene: Push-Pull Carbene	3
13	Reactivity of Carbene	3

Learning Outcome

Students are able to establish a solid understanding on the principles of main-group (*s* and *p* block) element chemistry.

Student Assessment

Students will be assessed by:

a. Continuous assessment (50%)

b. Final examination (50%)

Textbooks/References

Greenwood, Norman, and A. Earnshaw. *Chemistry of Elements*. Oxford, UK: Elsevier Science, 1997. ISBN: 9780750633659