

Chemistry 7300

Reactions and Synthesis in Modern Organic Chemistry, Spring 2017

Instructor: Dr. Tom Chang
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Meeting Time/Place: Meeting time: Monday and Thursday 11:00 – 12:15, W333

Office Hour: drop by with or without appointment

Texts: none

Topics:

1. Carbohydrate Chemistry
2. Stereoselective Aldol Reaction
3. Metal-catalyzed Coupling Reactions

Grading Scheme:

Point Distribution: four exams (80%) and final report (20%)

Exam: (monthly):

Time: TBD

Content: materials discussed in the class up to the time of delivering the exam.

Final Report and Presentation:

For the final report, you can choose a recently discovered natural product as a target for proposing a total synthesis. You need to turn in a final report in the format of a proposal (12 page max. including figures, tables and schemes) as the final report, which includes background, significance, innovation, approach and references. You will prepare a 30-40 min. presentation to talk about your proposal.

Assessment:

A set of questions of reaction mechanism will be given with the same mechanism or reaction in the monthly quizzes. The improvement will be evaluated.

Learning Objectives

General Learning Objective	Examples of Specific Objectives
Gaining factual knowledge	a. Use different protecting groups in the synthesis.

(terminology, classifications, methods, trends)	b. Design the synthesis of various carbohydrate building blocks.
	c. Know the compatibility of various protecting groups.
	d. Use 2D NMR for structural characterization.
Learning fundamental principles, generalizations, or theories	a. Apply the models for the prediction of stereoselectivity of aldol reaction.
	b. Use the stereochemistry of carbohydrates to perform selective transformation.
	c. Predict the stereoselectivity of glycosylation.
	d. Explain the reaction mechanisms by using the concepts of steric hindrance, stability of carbocation, and leaving group capability.
Learning to apply course material (to improve thinking, problem solving, and decisions)	a. Write correct electron-pushing mechanisms for the topic reactions in each topic.
	b. Design a total synthesis of a complex natural products.