



# HANYANG UNIVERSITY

## 2019 HISS Research Project (Heterogeneous Catalysis for Hydrogenation and Dehydrogenation Reactions)

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Laboratory Research Center Information	
Topics	Heterogeneous catalysis for hydrogenation and dehydrogenation reactions
Activities	<ul style="list-style-type: none"><li>- Catalyst synthesis</li><li>- Reaction experiment using batch-type reactors</li><li>- Data collection and analysis</li></ul>
Achievement	<ul style="list-style-type: none"><li>- Basic learning of heterogeneous catalysis skills</li><li>- Publication of a SCI(E) article</li></ul>

Pre-requisite & Eligibility	
Academic Background	<ul style="list-style-type: none"><li>- Chemical Reaction Engineering</li><li>- Analytical Chemistry</li><li>- Heterogeneous Catalysis</li></ul>
Relevant Experience	<ul style="list-style-type: none"><li>- Catalyst synthesis</li><li>- Experiment for catalytic reactions</li></ul>
Language	Proficient English speaking and writing

Objective & Description:	The student is asked to synthesize supported metal catalysts and utilize them for hydrogenation and dehydrogenation reactions. The measured dataset will be interpreted in order to evaluate the activity and life of the prepared catalysts. This work will contribute to understanding the practical knowhow of heterogeneous catalysis.		
Project Duration	6 weeks	Project Hours:	minimum 80 hours

Schedule:	Weekly Topic & Activities	Student Assignment
Week 1	<ul style="list-style-type: none"><li>- Introduction</li><li>- Literature survey</li></ul>	<ul style="list-style-type: none"><li>- A report on basic principles of hydrogenation and</li></ul>

### Hanyang International Summer School

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	<ul style="list-style-type: none"><li>- Build a simple challenging task for catalytic reactions</li></ul>	dehydrogenation reactions
Week 2	<ul style="list-style-type: none"><li>- Catalyst synthesis using conventional techniques such as impregnation, precipitation</li><li>- Make an idea of a new synthesis method for supported metal catalysts</li></ul>	<ul style="list-style-type: none"><li>- Report on practical catalyst synthesis</li><li>- Report on a new catalyst system</li></ul>
Week 3	<ul style="list-style-type: none"><li>- Carry out the hydrogenation reaction using a high-pressure batch reactor</li><li>- Data collection</li></ul>	<ul style="list-style-type: none"><li>- Report on the measured hydrogenation reaction results with respect to the prepared catalysts</li></ul>
Week 4	<ul style="list-style-type: none"><li>- Analysis of hydrogenation reaction results</li></ul>	<ul style="list-style-type: none"><li>- Report on kinetic parameters for each catalyst in the hydrogenation reaction</li></ul>
Week 5	<ul style="list-style-type: none"><li>- Carry out the dehydrogenation reaction using a ambient-pressure quartz reactor</li><li>- Data collection</li></ul>	<ul style="list-style-type: none"><li>- Report on the measured dehydrogenation reaction results with respect to the prepared catalysts</li></ul>
Week 6	<ul style="list-style-type: none"><li>- Analysis of dehydrogenation reaction results</li></ul>	<ul style="list-style-type: none"><li>- Report on kinetic parameters for each catalyst in the dehydrogenation reaction</li></ul>

	Attendance	Weekly Report	Final Presentation or Paper
Evaluation	30%	40%	30%