

International Internship at Colorado State University

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Period: 1st April–31st August (5 months)

Country: United States of America

Supervisor: Prof. Eugene Y.-X. Chen

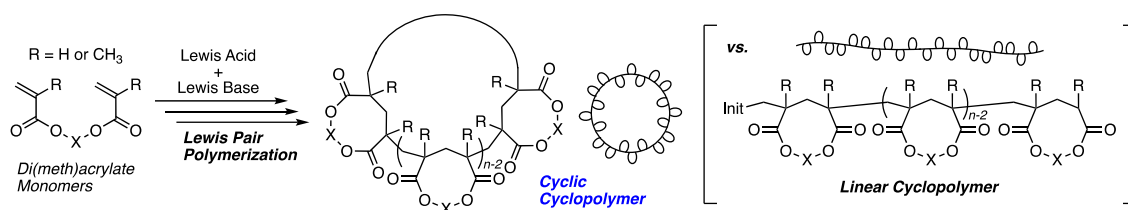
Institute: Department of Chemistry, Colorado State University

Research at Colorado State University

I visited the Chen Group at Colorado State University (CSU) because Prof. Eugene Chen is a great chemist in the field of synthetic polymer chemistry (**Figure 1**). The recent research topics of the group are mainly Lewis pair polymerization (LPP) of (meth)acrylate monomers for one-shot block copolymer synthesis and cyclic polymer syntheses and development of circular polymer materials. During this internship, I worked on the LPP of di(meth)acrylate monomers toward synthesis of the cyclic cyclopolymers, which have a macrocyclic backbone and repeating small cyclo-units on



Figure 1. Photo with the labmates.



Scheme 1. This work: LPP of di(meth)acrylate monomers toward synthesis of the cyclic cyclopolymer.

the backbone (**Scheme 1**). I previously achieved synthesis of such a unique topological polymer via the cationic polymerization of a divinyl ether monomer and revealed the abnormal thermal property through the comparison to the linear cyclopolymer, thus I tried to synthesize the cyclic cyclopolymer from the different monomers via the different polymerization system and reveal that such unique property is derived from the rigid ring structure of the cyclic cyclopolymer regardless the monomer species. As the results of a lot of trials, I found that the LPP of the di(mith)acrylate monomers gave quite different products according to the combination of Lewis acid and Lewis base. Using the proper Lewis pair, well-defined cyclopolymer without obvious cross-linking could be obtained though it is still unclear whether the backbone topology is cyclic or linear. This research project was taken over by a PhD student at the Chen Group. We are planning to continue the discussion toward publication.

My Life in Fort Collins

Fort Collins is a very beautiful city located at the foot of the Rocky Mountains (**Figure 2**). The campus of CSU is surrounded by a rich nature and I could find squirrels, rabbits, prairie dogs, and eagles. Fort Collins is safe and comfortable place to live with free buses. I lived in CSU International House with a roommate who is from San Diego in California State and studies history and education (**Figure 3**). We shared our own culture and for instance we enjoyed shogi (finally I lost!). This room sharing must have greatly improved my English and understanding about American culture and history. Through the one-day trips provided for international students, and I could make many



Figure 2. Photo of Old Town in Fort Collins.



Figure 3. Photo with my roommate.

friends from all over the world and enjoy hiking in Rocky Mountain National Park and watching rodeo. I also joined the Japanese community in Fort Collins and enjoyed potluck home parties, paddle boarding, fishing, and the aquarium in Denver. In addition, I traveled to Los Angeles, San Francisco, and New York on vacation.

Acknowledgement

I would like to thank Prof. Eugene Chen Y.-X. for accepting my internship, all of the labmates for supporting my experiments, and all involved for making my life in the US fruitful. My visiting was supported by Overseas Challenging Program for Young Researchers provided by Japan Society for Promotion of Science (JSPS).