Micelle-Catalyzed Metathesis Reactions In-Flow

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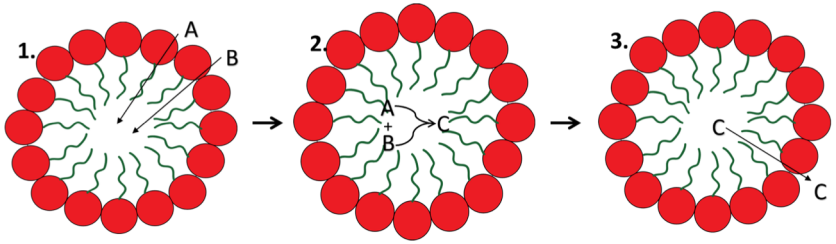
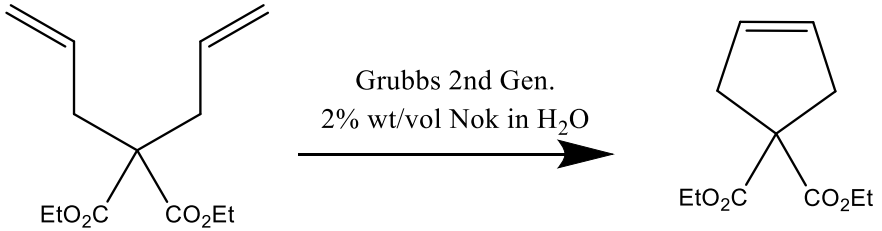
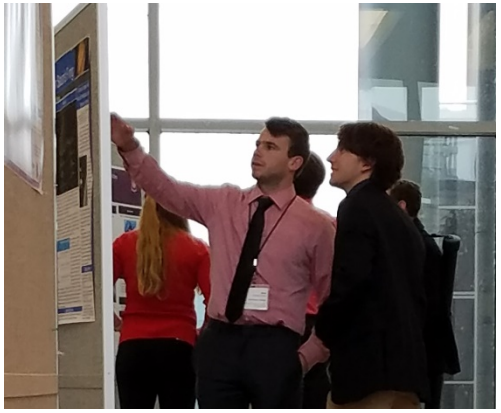
Water is in many ways the ideal “green” solvent – it is non-toxic, abundant, and renewable. Unfortunately, the water insolubility of organic compounds limits its ability to facilitate organic reactions. Recent work on using aqueous micellar solutions have helped remove the insolubility challenge. Non-polar organic compounds are entropically driven into the interior of the micelle and react. Flow chemistry has generated increased interest for organic synthesis, especially in the pharmaceutical industry. Compared to traditional batch chemistry, reactions conducted in flow occur faster, have greater temperature homogeneity, enable rapid changes to conditions for rapid condition screening, and allow for safe high-pressure conditions. We report the results of micelle-catalyzed metathesis reactions, in-flow. We successfully completed a ring-closing metathesis reaction under these conditions of diethyl diallyl malonate in yields compatible to those obtained in batch conditions of either dichloromethane or through micelle-catalyzed reactions.

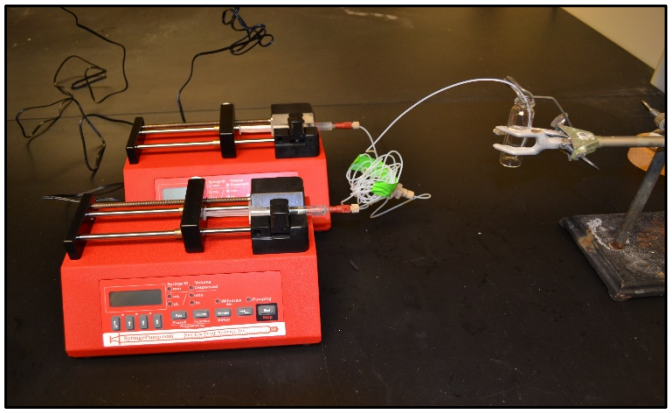
Michael Jones has worked with Dr. Brownholland since the Summer of 2017 and will be well positioned to earn a position in industry or in graduate school following his graduation in 2019.







Michael Jones describing his research at conference in Chicago



The flow apparatus used for the experiment