

Catalysis for Green and Sustainable Chemicals Production

Dr. Akshat Tanksale

Associate Professor (Monash University)



2018年12月17日(月)15:00–16:30

創成科学研究棟 4階セミナー室 BC

<http://www.cat.hokudai.ac.jp/access.html>

Biomass, in particular lignocellulose and microalgae, are rich in carbon and have several functional molecules in its structure, which can be utilised for the production of chemicals necessary to replace the petrochemicals. This is the focus of Catalysis for Green Chemicals group led by Dr Akshat Tanksale. This presentation will give an overview of the recent works done in the group. The focus of the group is on developing novel catalysts (NanoCatalyst Platform) for enabling the Syngas Platform and Biorefinery Platform. Waste biomass such as wood waste (sawdust, wood chips etc.) or microalgae are used as feedstock in these two conversion platforms.

Syngas Platform: In the Syngas Platform, whole biomass is converted into primary molecules such as CO, CO₂ and H₂, using catalytic steam gasification in single millisecond residence time flash volatilisation reactor, which converts the biomass into clean syngas without any char or tar production. This gas can then be used for producing secondary chemicals like formaldehyde and its derivatives using an innovative liquid phase hydrogenation system or liquid fuels using catalytic reactors.

Biorefinery Platform: In the biorefinery platform, we have two strategies. We can either pre-treat the biomass feedstock to separate hemicellulose, cellulose and lignin, followed by catalytic conversion of each component into the value added secondary chemicals. Alternatively, we can use the whole biomass and convert them into secondary chemicals in a single step, followed by separation to purify the secondly chemicals.

Dr Akshat Tanksale completed his PhD at The University of Queensland in 2008 examining nanomaterials / chemical reaction engineering. This was followed by a postdoctoral position at UQ examining the conversion of biomass to liquid fuels and chemicals and hydrogen storage. Joining Monash University in 2011, Dr Tanksale leads the Catalysis for Green Chemicals group where his interest is in the field of heterogeneous catalysis for conversion of biomass to fuels and chemicals using nanomaterials. He has published over 35 peer review papers in high impact journals and has 4 patents. He has won numerous awards and fellowships, including the Caltex Award for Excellence in Chemical Engineering by the Australia and New Zealand Federation of Chemical Engineers.

問合せ先: 触媒科学研究所・Abhijit Shrotri(ashrotri@cat.hokudai.ac.jp・011-706-9137)、
福岡淳(fukuoka@cat.hokudai.ac.jp・011-706-9140)