SÉMINAIRE

Génie chimique et génie biotechnologique

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UNIVERSITY OF SASKATCHEWAN

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12h15 au local C1-5006

Faculté de génie

In-Depth Understanding of a Ni-Co/$MgAlO_x$ Bimetallic Catalyst for CO_2 Reforming of CH_4

CO_2 reforming of CH_4 plays important roles in clean coal technology, renewable energy production, and biomass utilization. However, a viable (active, stable, and economical) catalyst is a must to facilitate this reaction. Ni-based catalyst is one of the most promising catalyst candidates but the long-term problem for this kind of catalyst is its tendency to be deactivated by carbon formation. With efforts in catalyst design and trials in performance tests, we have had a Ni-Co/MgAlOx catalyst which can minimize the carbon formation such that the CO_2 reforming of CH_4 reaction can be operated over the catalyst for 2000 h with high activity and selectivity.

This presentation will answer the following questions: 1) Is the catalyst preparation method developed the sole one to synthesize the right catalyst material? 2) How to formulate the active metallic nanoparticles in the right size during catalyst reduction? 3) What roles does the second metal Co play during the formation of metallic nanoparticles? 4) Has Ni-Co alloy formed during catalyst reduction? In this presentation, we will see how synchrotron X-ray absorption spectroscopy was used to answer some of the questions.

Éléments biographiques

Dr. Hui Wang is an associate professor in the Department of Chemical and Biological Engineering of the University of Saskatchewan. He received his PhD from University of Alberta. With experience working in industry, universities in China, Australia and Canada, and a US national laboratory, Dr. Wang's expertise covers heterogeneous catalysis, separation engineering, chemical reaction engineering, and synchrotron X-ray absorption spectroscopy. He has been involved in the projects of developing carbonyl sulfide hydrolysis catalyst, H_2S scavenger and sulfur removal technology. The method he and his students and co-workers developed to make CO_2 reforming of CH_4 catalyst, which allows long-term stable operation by minimizing the carbon formation side reaction, has been awarded a US patent.

Dr. Wang and his group are also investigating hydrogen production from splitting H_2S, mercury capture using cheap adsorbents, and catalytic combustion efficiency. Dr. Wang has authored and co-authored over 100 publications including journal papers, book chapters, invited and keynote lectures, conference papers and presentations, and research reports. He recently received the Award of Innovation from the Innovation Place of Saskatoon and the Industrial Liaison Office of University of Saskatchewan.

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