Northeastern University
College of Engineering

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Distinguished Seminar Speaker

Driving Sustainability: Empowering Chemical Engineering for a Net Zero Process Industry

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Abstract: Due to our increasing awareness of the impact of climate change on our society, unit operations in our manufacturing processes, including those in chemical industry, have to be greenified and made less dependent of fossil resources. One option is to use plastic waste or biomass, but this is less straightforward than what is generally believed. Additionally there is so-called electrification of the chemical industry. This is still in its infancy but there are many scientific and technological challenges to be solved. These important but far from trivial energy and materials transitions require not only the introduction of new ways of heat management and other, often not yet fully explored, chemical conversion processes in which green electrons are used, but also the development of new materials including large-scale heating coils, easily chargeable battery systems as well as catalyst materials. For each of these developments, there is the issue of materials scarcity as well as durability as the introduction of these production processes should also be cost effective and overall more sustainable than the existing ones.

Biography: Kevin Van Geem is full professor in the Faculty of Engineering and Architecture at Ghent University (UGent). He is director of the Center of Sustainable Chemistry and director of the board of the Laboratory for Chemical Technology of Ghent University. He is CTO of CAPTURE, an inter-university platform grouping 100 faculty members of different universities with ambition to accelerate radical technological innovations in the field of sustainable resource recovery. His main research interest is reaction engineering in general, with a focus in particular the transition from fossil to alternative resources such as biomass, CO/CO2 and plastic waste. He is a former Fulbright Research Scholar of MIT and visiting professor at Stanford. He is in charge of the pilot plants for chemical recycling, oxidative coupling of methane, steam cracking, biomass pyrolysis and super dry reforming. He is the author of more than two hundred scientific publications, has 3 patents and he is managing director of his own spin-off company on modelling steam cracking. He is involved in electrification, process intensification, machine learning & data mining, drug design, scale-up and process modelling.

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