PROCESS SYSTEMS ENGINEERING NL

Symposium

PSE-NL Summer Symposium

The added value of PSE for successful Bioeconomy

Friday July 8th 2022
from 12:30 to 18:00

at **University of Twente** and **MS-Teams**

These are PSE-NL's industrial members:

Corbion

ROYAL COSUN

FLUOR

Unilever

ALBEMARLE

DANONE
ONE PLANET. ONE HEALTH

Process Systems Engineering NL is a knowledge network that aims to offer a platform for sharing the best practices and scientific advancements in the PSE area. The systems approach has a strong track record of usage in industry to improve the decision making, to optimize plant configurations, chemical process conditions, molecular synthesis routes, and to control biological synthesis. The role of PSE is even more relevant now in the context of transition to bio-based raw materials and renewable energy. PSE-NL can help bolstering the interests and careers of members, as well as initiating and carrying out industrial projects, making contributions to technology development and application projects with industry, while fostering academic research.

Venue: University of Twente, Building Waier 3

Program:

12:30 – 13:15	**Lunch**
13:15 – 13:30	**Word of welcome** (PSE-NL Chair)
13:30 – 13:50	**Exploring the potential of biobased concepts using PSE** *by Asst. Prof. Dr. Ir. Ellen Slegers, Wageningen University* *If needed, 5 min time slot for questions, remarks, and short discussions*
13:55 – 14:10	**Pitch for each PhD thesis nominated for the Johan Grievink PSE Award** *by the nominees (5 min each)*
14:10 – 14:30	**Design of a treatment protocol to improve the health of B12 deficient patients** *by Ir. Gabriela Daisy Hadiwinoto, PDEng, TUDelft* – Johan Grievink PSE Award winner in 2021 *If needed, 5 min time slot for questions, remarks, and short discussions*
14:35 – 14:50	**Coffee break**
14:50 – 15:10	**Fast Pyrolysis: from the lab to a commercial process and beyond** *by Dr. Ir. Tijs Lammens, BTG Bioliquids* *If needed, 5 min time slot for questions, remarks, and short discussions*
15:15 – 15:35	**Studying the impact of substrate heterogeneity in bioreactors with fluid simulations** *by Asst. Prof. Dr. Ir. Cees Haringa, TUDelft* *If needed, 5 min time slot for questions, remarks, and short discussions*
15:40 – 15:50	**Announcement of the Johan Grievink PSE Award winner for an outstanding PhD thesis in PSE** *by the Chairmen of the Jury Committee*
16:00 – 16:45	**High Pressure Lab tour at University of Twente**
17:00 –	**Closure and social event (Lustrum PSE-NL)**

Please register your attendance by email at pse-nl@outlook.com before **Friday 30th June 14:00**. Participation fee is **25 EUR** for non-PSE-NL members - if attending the event at University of Twente, or 15 EUR via MS-Teams. We highly encourage physical presence at University of Twente!

Abstracts

Exploring the potential of biobased concepts using PSE *by Asst. Prof. Dr. Ir. Ellen Slegers*

Designing biobased chains is challenging since many feedstocks and processing technologies can be selected to obtain a range of marketable products. To reduce the number of choices it is crucial to identify the most promising processing routes with both economic and environmental impacts taken into account. Furthermore, typically data-based sustainability assessments are performed only on systems with high TRL. This presentation will discuss how Process Systems Engineering can be used to explore the potential of biobased concepts and guide prospective assessment of biobased chains.

Fast Pyrolysis: from the lab to a commercial process and beyond *by Dr.Ir. Tijs Lammens, BTG Bioliquids*

The presentation will describe the biomass fast pyrolysis process as developed originally by Biomass Technology Group, a spin out from the UT, which has now been commercialized by BTG Bioliquids. Besides our process itself the applications of fast pyrolysis bio-oil will be described, from the commercial ones to the applications that are under development at pilot or lab scale.

Studying the impact of substrate heterogeneity in bioreactors with fluid simulations *by Asst. Prof. Dr. Ir. Cees Haringa, TU Delft*

Whereas lab-scale bioreactors can often be considered to be ideally mixed in terms of substrate, the same does not hold for their production scale equivalents. The implication is that microbes perceive continuous fluctuations in their environment, which may impact their metabolic response, and thereby the performance of the overall process. By combining computational fluid dynamics with biokinetic models, the impact of heterogeneous environments on industrial bioprocesses can be estimated; such methods can be used to analyze and remedy observed production losses in established bioprocesses, or, ultimately, to design more robust bioprocesses by accounting for potential interactions between microbes and the industrial environment from the earliest stages of process design.

Speakers

Ellen Slegers is Assistant Professor at Wageningen University. Her research aims at designing and optimising sustainable biobased processing chains, and the connected supply chains. In her work she combines principles from process systems engineering, operations management, and sustainability analysis.

Tijs Lammens works as Senior Process Engineer at BTG Bioliquids. He is a chemical engineer with a MSc from Twente and a PhD from Wageningen University. He has dedicated his career to the development of renewable resources. First as a biofuels researcher at Shell Global Solutions, then as a consultant at BTG and since 2018 as a process engineer at BTG Bioliquids.

Cees Haringa holds a BSc and MSc degree from TU Delft in chemical engineering, followed by a PhD on CFD simulation of industrial fermentation systems. For this work, he was awarded with the inaugural DECHEMA industrial bioprocess award. He worked as a CFD scientist at DSM biotechnology center, from 2017-2020, and from 2021, he is assistant professor in the bioprocess engineering group, at TU Delft. Cees has a strong passion for creating a sustainable process industry.