

Press release

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<http://www.efce.org>

Pulsed plasma ethylene process scoops EFCE process intensification award

Dr. Evangelos Delikonstantis has won the **2021 EFCE Excellence Award in Process Intensification** for his ground-breaking work on a methane-to-ethylene conversion process.

Delikonstantis' PhD work, titled "*Plasma-Assisted Non-Oxidative Methane Coupling to Olefins*", set out how methane can be converted to ethylene using a nanosecond pulsed plasma. In his work he recorded by far the highest ethylene yield ever achieved from atmospheric plasma (ca. 20 %) without the use of any catalyst, according to Nicolas D Boscher, project leader at Luxembourg Institute of Science and Technology (LIST) and one of the external evaluators of Delikonstantis' PhD thesis.



He noted that beyond the non-oxidative methane coupling to ethylene, the findings demonstrate the potential of nanosecond pulsed plasma for catalysis and should pave the way to other important chemical conversion reactions. If powered by renewable electricity, the process could pave the way for novel low-carbon ethylene production processes, with an estimated carbon footprint of 1.3kg of CO₂-equivalent per kilogram of ethylene.

The work has so far been the subject of ten peer-reviewed articles which have been cited over 150 times, underlying the scientific impact of his research.

Judges from the EFCE Working Party on Process Intensification commented: "The most impressive aspect of his PhD thesis is the holistic approach [Delikonstantis] applied in his research, ranging from plasma reactors design, realization and optimization to reaction mechanism investigation and plasma-assisted processes evaluation at a plant-wide scale. This is very rare for just a single PhD project as multi-disciplinary knowledge, thinking and capabilities are needed."

Delikonstantis carried out his PhD project between February 2015 and June 2010 at KU Leuven in Belgium, under the supervision of Professor Georgios Stefanidis.

Since the completion of his PhD, Delikonstantis moved to Ghent University where he continues to work on the decarbonization of the chemicals industry by creating CO₂-based chemicals via electrified processes. Other focus areas are energy optimization/heat integration, life cycle analysis and techno-economic evaluations.

The award will be presented on Thursday, 23 September 2021 in the Session on "Process Intensification" during the 13th European Congress of Chemical Engineering & 6th European Congress of Applied Biotechnology (ECCE13 & ECAB6).

Delikonstantis will receive a prize of €1500, which is generously sponsored by Microinnova Engineering GmbH.



Ends

Related links

EFCE media centre (<https://efce.info/News>)

EFCE Working Party on Process Intensification (https://efce.info/WP_PI.html)

13th European Congress of Chemical Engineering (ECCE13)
(<http://ecce-ecab2021.eu>)

Notes to media

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About chemical engineers

Chemical, biochemical and process engineering is the application of science, maths and economics to the process of turning raw materials into everyday products. Professional chemical engineers design, construct and manage process operations all over the world. Oil and gas, pharmaceuticals, food and drink, synthetic fibres and clean drinking water are just some of the products where chemical engineering plays a central role.

About EFCE

Founded in 1953, The European Federation of Chemical Engineering (EFCE) is a non-profit-making association, whose object is to promote co-operation in Europe between non-profit-making professional scientific and technical societies in 30 countries for the general advancement of chemical engineering and as a means of furthering the development of chemical engineering. See www.efce.org

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These customer-specific solutions are characterized by quality by design. The product portfolio ranges from process development to production plant solutions in tons-per-hour scale.

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