



BIZEOLCAT

BIFUNCTIONAL ZEOLITE BASED CATALYSTS AND INNOVATIVE PROCESS FOR SUSTAINABLE HYDROCARBON TRANSFORMATION

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WHAT'S NEW?

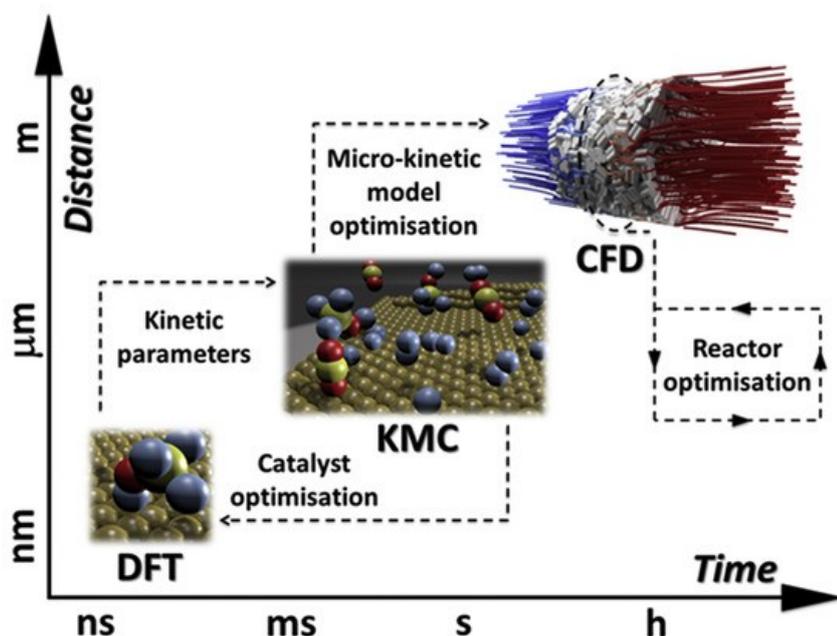
BiZeolCat Project is glad to inform you about the main results achieved so far: the project developing is suffering of some delays due to covid-19 and a plan for boosting activities has been put into practice to recover the activities in the next months.

Hoping pandemic setbacks will be overcome as soon as possible, BiZeolCat people recommend you stay safe and enjoy the newsletter reading!

Ab Initio Multiscale Process Modeling of Ethane, Propane and Butane Dehydrogenation Reactions: A Review.

Authors: Luka Skubic, Julija Sovdat, Nika Teran, Matej Huš, Drejc Kopač and Blaž Likozar
Department of Catalysis and Chemical Reaction Engineering, National Institute of Chemistry (Slovenia)

Olefins are among the most important structural building blocks for a plethora of chemical reaction products, including petrochemicals, biomaterials and pharmaceuticals. An ever-increasing economic demand has urged scientists, engineers and industry to develop novel technical methods for the dehydrogenation of parent alkane molecules. In particular, the catalysis over precious metal or metal oxide catalysts has been put forward as an alternative way route to thermal-, steam- and fluid catalytic cracking (FCC).



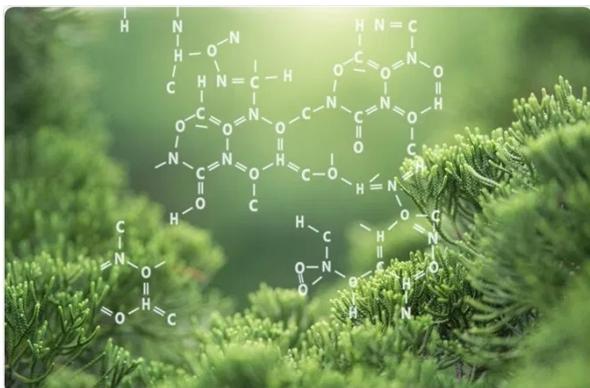
In this review article, alkane dehydrogenation overview was presented in terms of multiscale modeling. We concentrated on ethane, propane, and butane dehydrogenation, presenting in a thorough manner the studies which focused on theoretical modeling. Theoretical understanding can often provide an insight into the catalyst nature, especially when the surface is decorated with metal dopants, or when the geometry is complex with

steps, kinks, or different shapes. In such cases, in silico techniques can often provide order-of-magnitude estimates and trends that can be used to compare different materials, and to be used as a guide for the catalyst synthesis and the experimental setup.

The main conclusion is that for each alkane dehydrogenation process, there exist various catalysts, which show different performance. While Pt-based catalysts are most common among all processes, we find that other types are studied and provide different advancements in terms of cost, environmental issues, and/or catalytic performance such as selectivity, conversion, activity, degradation, etc. Another important aspect that we consider is whether the dehydrogenation process is oxidative or non-oxidative.

Open Access manuscript: [link](#)

Website: BiZeolCat Informs!



New in the website [#BizeolcatInforms!](#) is born to present the assumptions on which the project's scopes rely on to the general public. Bizeolcat, even facing high technological issues, aims to have huge impacts on the whole society, fostering circular economy and helping the economy's decarbonization. Therefore, the public is one of the most important stakeholders of the project.

Thanks to short notes reporting information about the main topics (chemistry, physics, industrial processes) involved in the project development, [BizeolcatInforms!](#) aims to reduce the gap in communicating the project's

impacts on the wider audience possible. Look at our issues:

[What is gas flaring?](#)

[From gas flaring to valuable chemicals: how?](#)

BIZEOLCAT EVENTS

WEBINAR: New & innovative methods for the conversion of alkanes to olefins and aromatics

Date: 13th April 2021



[C123](#), [ZEOCAT-3D](#) and [BIZEOLCAT](#) projects funded in 2019 by Horizon 2020 Research and Innovation (RIA) presented [innovative and greener ways to convert alkanes into olefins](#) and aromatics in a joint webinar.

The free webinar, organized by [SINTEF](#) (Norway), aimed to inform stakeholders, and interested citizens exchanging lessons learned and advancements in "Catalytic transformation of hydrocarbons".

In the first part of the webinar, the three projects were presented, while in the second part, specific challenges of each project have been addressed.

All presentations and related material are available at the Bizeolcat WEBSITE: [Download presentations](#) (PDF).

The webinar was very successful accounting for 141 persons registered, with an average of 75 participants attending during the whole event!

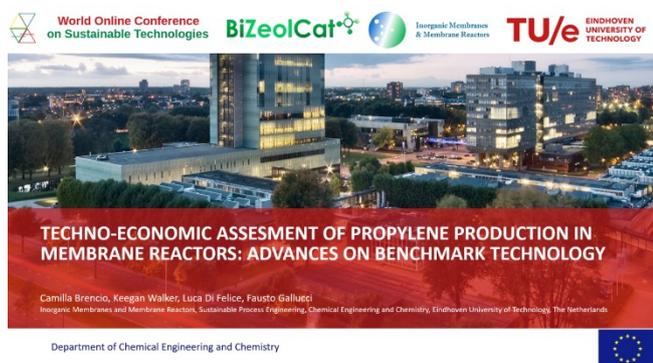
World Online Conference on Sustainable Technology (WOSCT 2021)

Date: 17th-19th March 2021

Bizeolcat Partners actively participate at the World Online Conference on Sustainable Technology (WOSCT 2021) held online.

The purpose of WOSCT is to provide a forum where representatives from industry, public laboratories, universities, and government agencies can meet, discuss, and present the most recent advances in all fields connected with sustainable technologies. The Conference will address all aspects, theoretical, experimental and prototype developments of Renewable energy sources, Membrane technology, Hydrogen and fuel cells systems, Power to fuel, Life cycle assessment.

Bizeolcat partners will be present at WOSCT as invited speaker with Prof. [Fausto Gallucci](#) from the Eindhoven University of Technology (NL), chairs of session with Prof. Gallucci and [Emma Palo](#) at Kinetic Technology and presenting research results in two session:



Techno-economic assessment of propane dehydrogenation in membrane reactors: advances on benchmark technology

[Camilla Brencio](#), Keegan Walker, Luca Di Felice, José Antonio Medrano Jimenez, Fausto Gallucci

Pd-based membrane permeance inhibition during propane dehydrogenation processes: experimental and modelling

[Camilla Brencio](#), Fabrice Fontein, Luca Di Felice, Alba Arratibel, Fausto Gallucci



EU Green Week 2021-

Date: From June 1-4



BIZEOLCAT has been presented at EURECAT stand of the EU Green Week to know more about catalytic transformation to develop a low carbon **economy**.

BIZEOLCAT was showcased as a key project working on **transforming unexploited resources into valuable products**.

6th VIRTUAL GENERAL

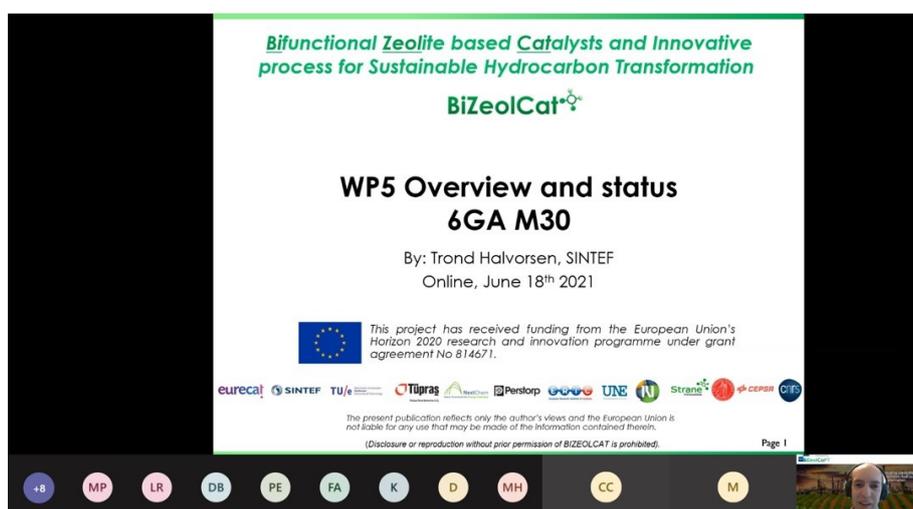
ASSEMBLY

Date 17-18 th June 2021

The main objectives of the meeting were the assessment of the project's achievements (milestones and deliverables) and a plan for the next steps.

In the picture, [Trond Halvorsen](#) (SINTEF) present the state of the art of Bizeolcat WP5 - Sustainability and Social Assessment which aims to demonstrate the environmental and social benefits derived by the development and application of BIZEOLCAT routes.

The meeting has been very intensive, and all the participants collaborate actively providing a friendly atmosphere and strengthening the relationships among the partners filling the gap of being effectively remoted connected.



UPCOMING EVENTS

7th GENERAL ASSEMBLY

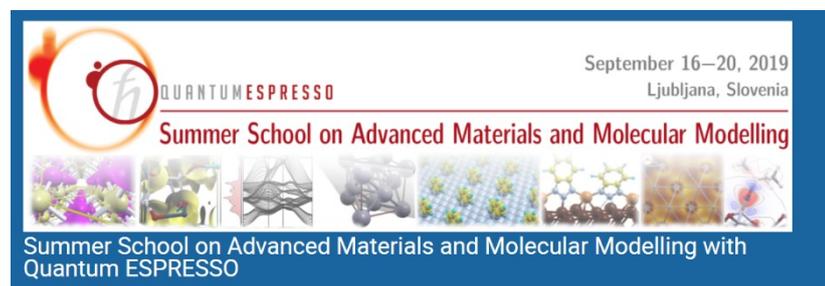
January 2022

The main objectives of the meeting will be the assessment of the project's achievements (milestones and deliverables) and a plan for the last year of the project. The partners hope the pandemic emergency will be finally over to meet in persons again.

All the details of the event will be reported on the project website just after the meeting close. STAY TUNED!

2021 Dissemination Activities

Several dissemination events are still planned for the year 2021:



[Summer School on Advanced materials and Modelling,](#)

Ljubljana, September 2021

[Annual Meeting of the Slovenian Chemical Society –](#)

Slovenia, September 2021



[International Symposium on Chemical Reaction Engineering \(ISCRE26\)](#)

India – New Delhi - December 2021



BIZEOLCAT Website

Visit the BIZEOLCAT project at the address – www.bizeolcat.eu and follow the project on LinkedIn, Twitter and YouTube.

Let us have your comments!

The next issue of the Newsletter will be released in December 2020

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Bizeolcat 2019

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