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Three doctoral students working in catalysis and separation, three prizes awarded by three different associations active in the field. A look at the three theses that have been singled out for praise.

Elsy El Hayek, from 2017 to 2020 a doctoral student at IFPEN, was awarded the 2022

Denise Barthomeuf Thesis Prize for her work on « "New acid zeolites obtained from silicogermanates » during the annual meeting of the French Zeolite Group (29 to 31 March 2022). Each year, this prize is awarded for thesis work involving zeolite-type porous materials.

Her work in a few words

The introduction of germanium during zeolite synthesis gives rise to large pores, thus improving the catalytic transformation of bulky molecules; but there are also challenges, such as the instability of silicogermanates. Current approaches to counter these problems have limited effectiveness. This thesis proposes an original way to stabilize silicogermanates, drawing on both theoretical calculations (DFT - density functional theory) and experimental work (synthesis, characterization, catalytic tests). The synthesized materials were tested as an acid phase for bifunctional hydroisomerization of n-decane and n-hexadecane. Their ability to accelerate chemical reactions is promising, thus opening perspectives for their use in the catalysis of stable silicogermanate derivatives.

Scientific advisors : Bogdan Harbuzaru, Céline Chizallet

On 17 January 2022, the Coordination Chemistry division of the Société Chimique de

France (French Chemistry Society) awarded the 2021 Thesis Prize, jointly with Nikos Kostopoulos (Université de Paris), to **Julien Petit**, a doctoral student with IFPEN from 2018 to 2021, for his work on "Exploration of a new reactivity in ethylene oligomerization: towards new dicationic nickel complexes".

His work in a few words

The **alpha-olefins** obtained through **ethylene oligomerization** are petrochemical intermediates used in the production of many daily products, including, in particular, polyethylene. This very fundamental thesis has led to the development of new methods for synthesizing dicationic Ni complexes, seldom described until now, and further explored their reactivity in ethylene oligomerization, with significant methodological advances in terms of demonstrating the **implied reactional mechanism**.

Scientific advisors: Lionel Magna, Pierre-Alain Breuil

During the 11th Conference of the Association Française de l'Adsorption (French

Adsorption Association) (27 and 28 January 2022), **Wassim Ammar**, a doctoral student at IFPEN since 2019, was awarded the prize for best oral presentation about the separation of second-generation sugars using zeolites.

His work in a few words

Wassim Ammar's thesis concerns "The study of the adsorption of sugars by separation agents: understanding the mechanisms involved". It specifies the mechanisms by which the properties of

the zeolite (chemical composition and structure) improve the adsorption selectivity of C5/C6 sugars . It is crucial to determine the enthalpic and entropic contributions of adsorption, induced by confinement in the zeolitic structure, in order to answer these questions and, ultimately, propose innovative solutions for the problem of the separation of these sugars.

Scientific advisors : Alain Méthivier, Maria Manko, Kim Larmier

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