

## MULTI-site organic-inorganic HYbrid CATalysts for MULTI-step chemical processes

## Enjoy Reading our second Biannual MULTI2HYCAT Newsletter in 2019

Welcome to our second biannual newsletter in 2019 where we inform you about the progress and MULTI2HYCAT achievements made in the last 6 months (Q1/Q2 2019) and give an outlook to the upcoming six-month period.

### Summary and Highlights

- 6<sup>th</sup> biannual project meeting held in Southampton (UK) in July 2019.**  
 The 6<sup>th</sup> biannual MULTI2HYCAT project meeting was hosted by UoS and held after 30 project months in Southampton, where the latest achievements were discussed.
- Smooth and goal-oriented workflow increases productivity**  
 All the hybrid catalysts prepared by CSIC, UPO and UoS with the CAGE contribution in the synthesis of the active site organic precursors were shared with the partners responsible for the physico-chemical characterization and for the catalytic evaluation.  
 During the past 30 months, the partners have synthesized over 90 catalysts and assessed their material and catalytic properties and probed their effectiveness in several distinct reactions.
- Dissemination activities**  
 In the last 6 months *three new scientific publications* have been issued. These articles are focused on several MULTI2HYCAT topics ranging from preparation methods to rational characterization and computational studies. The consortium attended *two conferences, one workshop* and *two fairs* and participated at the *Scientific Day-Talk and experiments* (International Day of Women and Girls in Science). The *website* has been continuously updated, and *three videos* were released.
- EC reporting**  
*Seven deliverables* were uploaded to the EU Participants Portal and another 2 milestones were reached.
- Stakeholder Online Survey is still [online](#).**  
 This survey aims at collecting the opinions of specialists from the fields of catalysis, pharmaceutical chemistry and process engineering towards the MULTI2HYCAT approach and the future of chemical industry.  
 Your personal opinion is important to us! Please take part in this survey – your answers will allow us to better meet your expectations.
- In 2020 MULTI2HYCAT will organise two specific workshops** during the project, one with an academic and one with a more industrial focus. Feel free to contact us by [mail](#) or on any of the channels shown below, if you wish to collaborate or express your ideas or questions and check the future events which will be attended by MULTI2HYCAT partners and get into a personal discussion.

Stay updated! Follow us on    for the latest news and visit our [website](#) to see the full list of events, publications and other documents.

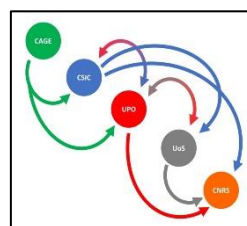
## 6<sup>th</sup> Biannual Project Meeting

On June 27<sup>th</sup> the MULTI2HYCAT Consortium met in Southampton to expose the progress made during the previous 6 months. In a friendly working environment, the current status of the project was discussed. At the beginning it was presented how the recommendations of the experts of the European Commission were incorporated into the project during the last months.



In the last half year, the work has focused on:

- ✚ Improving sample and workflow processes. The figure on the righthand side shows sample flow ( $\approx 90$ ) between different partners. In particular, the Skype activities among the partners were significantly increased to clarify the approach to the following topics: Suzuki reactions, Friedel-Crafts reactions, Multi-site platforms and reactions for multi-site platforms
- ✚ Continuing to raise awareness of the project through dissemination activities.
- ✚ Choosing the adequate multisiloxane platform for binding.
- ✚ Upscaling the selected precursors for the implementation of the demonstration activities.
- ✚ The synthesis of multi-functional organic-inorganic porous hybrid materials.
- ✚ Preparation and characterisation of hierarchical multifunctional catalysts.
- ✚ Characterisation of the catalysts after their catalytic testing since their stability and reusability are important parameters for the assessment of their catalytic performance. To do so, the experts in computational studies have been working in close collaboration with the catalyst developers.
- ✚ Reaction kinetics, TONs calculations, metal leaching, catalyst stability and reusability.



Since the last meeting, **seven deliverables** were uploaded to the EC participant portal. The Dissemination Activities Report is available to the public and can be downloaded here [D9.5](#). An action plan for the next 6 months was drawn up. In particular, the three milestones to be reached at the end of December were also the subject of discussion:



- ✓ M6. Scaled-up process to prepare organic-inorganic precursors
- ✓ M7. Scaled-up synthesis of active multi-functional organic-inorganic porous hybrid materials
- ✓ M8. Proof of concept reactions of particular relevance in the fine-chemical and pharmaceutical industries

Our next biannual meeting will be hosted by Prof. Leonardo Marchese and will be held in Rome in January 2020.

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## Dissemination activities

The MUTI2HYCAT consortium has published another 3 scientific publications related to the preparation, characterisation, modelling and application of hybrid catalysts. The partners attended two conferences, one workshop and two fairs and the consortium participated at the Scientific Day-Talk and experiments. Moreover, three videos were released:

### Articles

- **Influence of Silicodactyly in the Preparation of Hybrid Materials**  
*Chiara Ivaldi, Ivana Miletto, Geo Paul, Giovanni B. Giovenzana, Alberto Fraccarollo, Maurizio Cossi, Leonardo Marchese, Enrica Gianotti*; *Molecules*, 2019, 10(7), 24(5), 848-862, DOI: <https://doi.org/10.3390/molecules24050848>
- **Integrated theoretical and empirical studies for probing substrate-framework interactions in hierarchical catalysts**  
*Stephanie Chapman, Alexander J. O'Malley, Ivana Miletto, Marina Carravetta, Paul Cox, Enrica Gianotti, Leonardo Marchese, Stewart F. Parker, Robert Raja*; *Chemistry – A European Journal*, 2019, DOI: <https://doi.org/10.1002/chem.201901188>
- **Synthesis of 2D and 3D MOFs with tuneable Lewis acidity from preformed 1D hybrid sub-domains**  
*José María Moreno, Alexandra Velty, Urbano Díaz, Avelino Corma*; *Chemical Science*, 2019, 10(7), 2053-2066, DOI: <https://doi.org/10.1039/C8SC04372H>

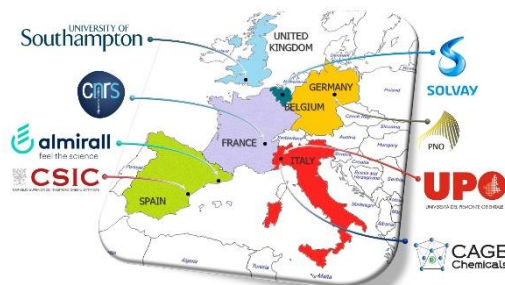
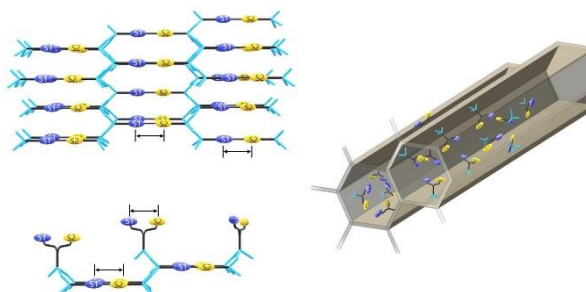
### Conferences, workshops, Scientific Day-Talk and experiments, fairs

- **British Zeolite Association 2019**, 11-12 April 2019, Birmingham (UK); one contribution: <http://www.bza.org/annual-meeting/>
- **HYMA2019**, 6<sup>th</sup> International Conference on Multifunctional, Hybrid and Nanomaterials, 11-15 March 2019, Meliá Sitges, Spain; two contributions: <https://www.elsevier.com/events/conferences/international-conference-on-multifunctional-hybrid-and-nanomaterials>
- **6<sup>th</sup> ENMIX Workshop**, 2-5 April 2019, Rome (Italy), one contribution <https://eventmanager.mlib.cnr.it/event/37/overview>
- **Scientific day-Talk and experiments** at the International Day of Women and Girls in Science, 11th of February 2019, Nules, Castellón, Spain; three contributions: <https://11defebrero.org/>
- **3rd Chemistry Partnering fair**, 25-26 February 2019, Frankfurt (Main), Germany; <https://european-chemistry-partnering.com/>
- **Bio-raffiniert X fair**, 26 February 2019, Oberhausen, Germany; <https://www.bio-raffiniert.de/>

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## Videos

Click on the pictures to start the videos or visit our [YouTube channel](#). While the first two were produced more for scientific purposes, the third one is more for children to explain the general functioning of catalysts.



First video: MULTI2HYCAT – A Story about High Cats and HyCats. Second video: MULTI2HYCAT – Presentation & Midterm Achievements



Third video: MULTI2HYCAT – What do MULTI2HYCAT and mashed potatoes have in common?

## Stakeholder Engagement – Participate in our Online Survey

In order to involve industrial and academic stakeholders from outside, the MUTI2HYCAT consortium launched an online stakeholder survey last year. The stakeholder online survey can be found on the project [website](#).

Please participate in our online survey since your personal opinion is important for us! Based on your answers, we want to identify the innovation potential for the chemical industry on the one hand and better meet your expectations on the other hand.

This survey should not take longer than 10 minutes. Thank you for granting us your time!

Stay updated! Follow us on [Twitter](#) [Facebook](#) [LinkedIn](#) for the latest news and visit our [website](#) to see the full list of events, publications and other documents.

## Upcoming events

Below you will find a list of future interesting events which also might be attended by the MULTI2HYCAT partners. In 2020 two specific workshops will be organized during the project, one with an academic and one with a more industrial focus. The industrial workshop will be probably coinciding with one of these conferences. We will keep you informed!

- ✚ The German Catalysis Meeting, 11-13 March 2020 (Weimar, Germany)
- ✚ International Conference on Chemical Engineering and Catalysis, 19-20 March 2020 (Berlin, Germany)
- ✚ International Green Catalysis Symposium, 30 March-2 April 2020 (Rennes, France)
- ✚ Global Conference on Catalysis and Chemical Engineering Conference, 20-22 April 2020 (Toronto, Canada)
- ✚ 3rd Edition of EuroSciCon Conference on CHEMISTRY, 27-28 April 2020 (Rome, Italy)
- ✚ CHEMUK 2020, 13-14 May 2020 (Manchester, UK)
- ✚ EUROPACT, 18-20 May 2020, (Copenhagen, Denmark)
- ✚ Catalysis (GRS), 27-28 June 2020 (New London, US)
- ✚ Advancing Sustainable Technologies Through Catalysis (GRS), 28 June-3 July 2020 (New London, US)
- ✚ GREENCHEM, 16-17 July 2020 (Las Vegas, USA)
- ✚ 17th International Congress on Catalysis, July 2020 (place to be defined)
- ✚ FEZA congress, 12-15 July 2020 (Brighton)

This is only a preliminary list for 2020. Visit the event section of our website regularly and find out more about the type, the titles and our people presenting at the different events!

## Contact Us

You can't make it to the events? Do you have ideas or want to partner with us? Are you interested in details or have questions? Whatever you desire, you can contact us at any time using one of the channels below. Looking forward to your message and your participation in our survey!

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For more info about the project visit the MULTI2HYCAT website at: [www.multi2hycat.eu](http://www.multi2hycat.eu)  MULTI2HYCAT



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