FKKT | UNIVERZA V LJUBLJANI
Fakulteta za kemijo in kemijsko tehnologijo

VABILO NA PREDAVANJE
V OKVIRU DOKTORSKEGA ŠTUDIJA
KEMIJSKE ZNANOSTI / INVITATION TO THE
LECTURE WITHIN DOCTORAL PROGRAMME IN
CHEMICAL SCIENCES

Assoc. Prof. Dr. Iñaki Gandarias Goikoetxea

Escuela de Ingeniería de Bilbao. Universidad del País Vasco/Euskal HerrikoUnibertsitatea (UPV/EHU)

z naslovom / title:

Engineering of Novel Catalytic Materials for the Development of Integrated Biorefinery Processes: From Lab to Industrial Application

v sredo, 21. 1. 2026 ob 15. uri
v predavalnici 1 v 1. nadstropju Fakultete za kemijo in kemijsko tehnologijo, Večna pot 113 ***/***
on Wednesday, 21. 1. 2026 at 15.00
in lecture room 1, 1st floor at the Faculty of Chemistry and Chemical Technology, Večna pot 113

Vljudno vabljeni! / Kindly invited!

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Abstract:

The transition towards a decarbonized and more sustainable society requires the extensive use of renewable resources. While the future of mobility is expected to rely largely on electrification and hydrogen, it is equally crucial to reduce the dependence on fossil feedstocks for the production of commodity chemicals. In this context, oxygenated monomers represent a clear example of molecules for which lignocellulosic biomass offers significant advantages over petroleum-based routes. However, turning this potential into reality demands the design of multifunctional catalytic systems that are active, selective, and stable under relevant operating conditions.

This presentation will highlight three case studies illustrating the research activities carried out in our laboratory. Starting from biomass-derived platform molecules such as furfural and 5-hydroxymethylfurfural, we develop heterogeneous catalytic materials tailored for integrated biorefinery processes. Through a combination of spectroscopic techniques, probe-molecule titration experiments, and density functional theory (DFT) calculations, we aim to establish clear structure–activity relationships. This approach enables us to identify the role of the different active sites and their mutual interactions, providing rational guidelines for the improvement of catalytic performance.

Finally, kinetic studies together with process design and integration analyses are employed to assess the technical and economic feasibility of the proposed catalytic systems, as well as to identify potential bottlenecks for scale-up. The presentation will conclude with the introduction of FURANTEK, our spin-off company focused on the industrial implementation of these technologies.