From deep eutectic solvents to (waste)water: improving reactivity in non-conventional media

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Jueves, 11 de julio 2024
12:00h
Sala de grados Edif. Físicas (Facultad Ciencias)

CICLO CONFERENCIAS **ISQCH** 2024

Instituto de Síntesis Química y Catálisis Homogénea

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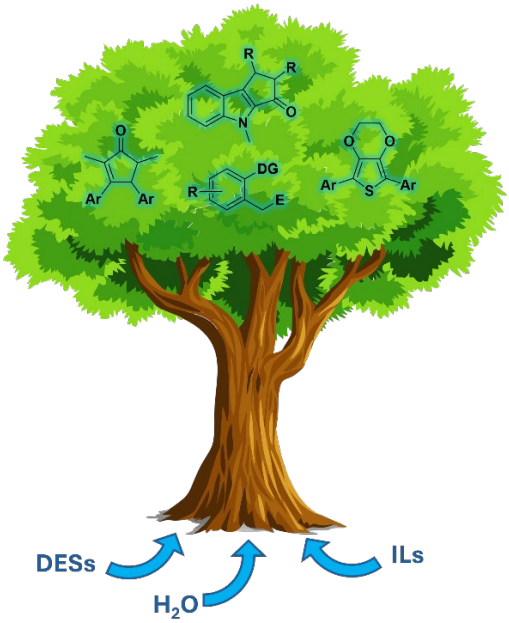
The new century has witnessed a surge in the application of non-conventional solvents to organic synthesis, addressing the challenge posed by the enunciation of the 12 Green Chemistry principles, in 1998. Notably, transferring a synthetic methodology into more sustainable media may as well have the potential to open the way to unexplored reactivity landscapes, leading to new solutions for synthesis.[1]

In the pursue of both sustainability and improved reactivity, in terms of yield, removal of an additive, or milder reaction conditions, we investigated the opportunities offered by different non-conventional solvents, including acid- and alcohol-based deep eutectic solvents, renewable-sourced ionic liquids, and industrial wastewater. Such solvents were utilized in various synthetic methodologies, selecting the properties of the medium to meet the specific requirements of each reaction. In particular, we focused our attention on the Nazarov cyclisation,[2] the benzylic lithiation of substituted toluene derivatives,[3] the Au(I)-catalysed intramolecular hydroarylation, and the Pd-catalysed direct C–H arylation of thiophene derivatives.[4] The results highlighted the advantages (as well as the challenges to be addressed) over “classical” organic solvents, *i.e.* volatile organic compounds, both in terms of reactivity and of streamlining of the post-reaction treatments.

Part of this work was carried out in the framework of a collaboration with the CHESO group at the University of Zaragoza, made possible thanks to the networking opportunities offered by the UNITA inter-university alliance.



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