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A Green Approach: Vicinal Oxidative Electrochemical Alkene Difunctionalization



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Invited for this month's cover picture is the group of Dr. Nisar Ahmed (Cardiff University, United Kingdom). The cover picture shows that vicinal oxidative electrochemical alkene functionalization is a powerful and sustainable approach that can readily build complex organic molecules without the use of external chemical oxidants and catalysts, proceed with excellent atom economies. Read the full text of the Minireview at [10.1002/celec.201801466](https://doi.org/10.1002/celec.201801466).

What is the most significant result of this study?

Vicinal oxidative electrochemical alkene difunctionalization is a powerful methodology that can readily build complex organic molecules without the use of external chemical oxidants and catalysts, providing products in high yield. The recent developments in alkene difunctionalization explained in this article not only mediate to design new green synthetic pathways using electrochemistry but will also facilitate the use of reactor technology for an easy and facile functionalization of alkenes.

What other topics are you working on at the moment?

Our group is working on new synthetic avenues with batch and flow electrochemistry, such as alkene functionalization, memory of chirality, heterocycles and glycosylations. Further-more, we are thinking to apply electrochemical methods for the recognition of biomolecules.

What future opportunities do you see?

The use of electricity as a reagent in chemical synthesis has been a fast-growing trend over the last two decades. This situation is changing rapidly, owing to many reasons and, in particular, to the continuing need to discover new reactivity and new reactions, and especially more sustainable processes. Electrochemistry serves as an efficient substitute to conventional synthesis, wherein the electric current provides a stoichiometric amount of the oxidizing or reducing agent. This approach avoids waste originating from the reagents and catalysts employed. Moreover, to perform reactions in continuous flow rather than in batch mode has led to large advances regarding safety and sustainability, owing to easy control over reaction parameters. Miniature chemical reaction devices with micro-channel(s), incorporated with electrodes known as electro-chemical microreactors, have been revolutionary in the field of organic chemistry. Many organic reactions can benefit from the physical properties of microreactors, such as enhanced mass and heat transfer due to a very large surface to volume

ratio as well as regular flow profiles, leading to improved yields with increased selectivities.

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