

Molecular (bio)hydrids materials for electrocatalytic CO₂ conversion

Bertrand Reuillard

Université Grenoble Alpes, CNRS, CEA, IRIG, Laboratoire de Chimie et Biologie des Métaux,
17 Rue des Martyrs, Grenoble Cedex F-38054, France

Bertrand.reuillard@cea.fr

Abstract:

The conversion of CO₂ into valuable chemicals and fuels represents a significant challenge in sustainable energy research.¹ The combination of molecular centers²⁻⁴ and enzymes^{5,6} at electrode material surfaces has been described over the past 10 years as a promising approach towards the developments of efficient devices for CO₂ conversion.

Such (bio)hydrid electrode constructions represent an opportunity to reach reactivity beyond the common 2e⁻/2H⁺ reactivity to generate more complex and value-added CO₂-reduction products. Moreover, the development of “cascade” or “tandem” systems,^{7,8} relying on the combination of several catalytic sites has recently enabled to improve the selectivity of the electrocatalytic processes toward the desired products.

Such interdisciplinary approaches, in which the organization of the catalyst site is paramount, should allow the development of new efficient electrocatalytic pathways for CO₂ conversion.

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