CATALYST FOR GREEN HYDROGEN GENERATION

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Photocatalysis and electrolysis are crucial processes for the development of a sustainable, clean energy system, since they enable solar fuel production, such as hydrogen by water splitting, as well as CO2 reduction [1,2]. In these processes efficient and robust catalysts for water oxidation are required and the reduction of employed amount of noble metals is crucial to reduce costs and increase the sustainability of the technology. We have employed electroless deposition by spontaneous galvanic displacement [1–4] as a simple, low cost, highly scalable technique. By varying the deposition parameters, optimal conditions for Pt and IrO2 deposition on Nickel foam have been achieved [5–7]. The electrode coverage by catalyst has also a positive impact on its stability, strongly decreasing the degradation rate, compared to the case of bare Ni foam. The average amount of noble metal in the best performing electrodes is well below the typical values adopted for PEM (Proton Exchange Membranes Electrolyzers) [8]. The proposed approach is highly promising for gas diffusion electrodes, and can be implemented in electrolytic cells, as well as in fuel cells.

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