Special Issue

Photo- and Electro-Catalysts for Carbon Neutrality

Message from the Guest Editors

The hydrogen evolution reaction (HER) is an excellent approach to replace steam methane reforming (SMR). Not only it can substantially decrease the amount of CO2 emissions during the process, but also the purity of H2 gas produced from the HER is much higher. However, the cost of H2 gas manufacturing from the HER is very expensive compared to that from SMR. This can be attributed to the catalysts used in the HER, which mostly contain noble metals (Pt, Ir, Ru). As a result, exploring efficient yet affordable catalysts for the HER becomes crucial and significant efforts have been dedicated to this field. Over the decades, versatile catalysts such as high-entropy alloys, metal–organic frameworks and 2-dimensional metal hydroxide/chalcogenides have been investigated in order to fulfill this goal. However, there is a long way to go in searching for practical catalysts, especially those that exhibit robust performance under industrial conditions. This Special Issue will present a collection of the most recent findings in photo- and electro-catalysts of the HER that aims to provide a broad overview of material design strategy for innovative HER catalysts.

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As the premier open access journal dedicated to molecular chemistry, now in its 29th year of publication, the papers published in *Molecules* span from classical synthetic methodology to natural product isolation and characterization, as well as physicochemical studies and the applications of these molecules as pharmaceuticals, catalysts, and novel materials. Pushing the boundaries of the discipline, we invite papers on all major fields of molecular chemistry and multidisciplinary topics bridging chemistry with biology, physics, and materials science, as well as timely reviews and topical issues on cutting-edge fields in all of these areas.

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