

Electrocatalytic alloy synthesis using pulsed laser for improving for Hydrogen evolution reaction performance

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The development of advanced electrocatalysts for sustainable and resource-rich hydrogen production by water splitting is the most important part to realize high-efficiency energy research. Research on the production of electrocatalyst that can replace conventional platinum, which is mainly used for hydrogen generation, is continuously being conducted. Therefore, in this study, an improved hydrogen evolution reaction was reported by forming a platinum-based metal alloys synthesized by using pulsed laser assisted synthesis method. The main advantages of this synthetic route over the conventional methods are of easy to control surface structure, size, rapid process, and no required of additional surfactant or reducing agent. In addition, we have also integrated pulsed laser process with ultrasonic technique to produce high yield and uniform size/surface distribution. Then, the fabricated metal alloys used as efficient electrocatalysts for the hydrogen production by water splitting and investigated by various electrochemical techniques like, cyclic voltammetry, linear sweep voltammetry, and electrochemical impedance spectroscopy.