

Synthesis of Nanoscale Molybdenum Carbide on Carbon Nanotube – Reduced Graphene Oxide Complex for Hydrogen Evolution Reaction in Alkaline Media

이건희, 윤덕현[†]

강원대학교

(youndh@kangwon.ac.kr[†])

Due to the environmental pollution and resource issues of fossil fuels, development of alternative energy is required. Hydrogen is a promising energy source because of its high energy density and cleanness. Electrochemical water splitting is a sustainable hydrogen production method, where platinum is the best catalyst in the HER (Hydrogen Evolution Reaction). Thus, development of electrocatalysts for HER with non-precious material is critical for hydrogen production. Here, we fabricated Mo₂C, Mo₂C/RGO, Mo₂C/CNT, and Mo₂C/CNT-RGO catalysts via modified urea-glass route. During the synthetic process, toxic gas such as CH₄ was not used and the urea was used as carbon source for carbide formation and nitrogen source for N-doping, indicating that our synthetic method is simple and safe. Among the prepared catalysts, Mo₂C/CNT-RGO showed the best performance for HER in alkaline media. The high HER activity of the Mo₂C/CNT-RGO is attributed to the synergistic effect of Mo₂C nanoparticles (highly active site for HER) and the CNT-RGO support (high surface area and conductivity).