

Controlling Valence State of Iridium Using CeO₂ for Efficient Oxygen Evolution Reaction in Acidic Media전우태, 윤덕현^{1,†}강원대학교; ¹강원대학교 화학공학과(youndh@kangwon.ac.kr[†])

Due to sluggish kinetics and highly corrosive environment, oxygen evolution reaction (OER) is bottleneck region for the commercialization of proton exchange membrane water electrolysis (PEMWE). Currently, Iridium-based materials are emerging as effective catalysts for OER reactions due to their superior activity and stability compared to other noble metals. However, iridium is very expensive and rare. Therefore, fabrication of highly active and stable iridium-based with reduced Ir content is essential.

Herein, we introduced CeO₂ as a support material for Ir due to its various beneficial effects. In particular, the unique redox properties between Ce(III) and Ce(IV) can be useful for inducing more Ir(III) species which is known as OER-effective. In this study, we fabricated IrO_x/CeO₂ with 20 wt% of Ir contents. Also displayed enhanced OER activity with a low overpotential value (263.4 mV at 10 mAcm⁻²) and good stability (40.2 mV increased for 10h at 10 mAcm⁻²).