

Hematite Photoanode Surface-modified with Phosphate Ions for Solar Water Splitting

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Hematite, α -phase of iron oxide is a very active and promising material for solar water splitting due to its small band gap (~ 2.1 eV), proper band positions, environmentally benign characteristics, and so on. In spite of its many advantages, a photoelectrode made of hematite usually works in strong basic electrolyte due to its high stability and performance in basic electrolyte. The problem is this condition is not friendly for the environment. In this study, the hematite photoanode was surface-modified with phosphate ions and prepared via a very simple method. It was confirmed that the hematite photoanode was successfully surface-modified with phosphate ions and it works even in neutral electrolyte. Furthermore, this photoanode showed high solar water splitting performance in neutral electrolyte (pH 7) which can be matched with that in strong basic electrolyte (pH 13.6).