Abstract

The existing energy demands can be reduced by creating straightforward and affordable electro-catalysts for the hydrogen evolution reaction (HER). The best Hydrogen production electro-catalyst with a unique hetero-structure MoS_2-$FeCo(OH)_x$ self-built on the copper foam was synthesized via Hydrothermal and Reflux methods. The excellent performance of MoS_2-$FeCo(OH)_x$/CF can be attributed to the mutual effect of metals and their interaction among them. With the small tafel slope value of 76.6(mV/dec) for HER, this catalyst demands the miniature over-potential of 150mV for HER at the current density of 100mA.cm^{-2} in an alkaline electrolyte. By using different strategies, $FeCo(OH)_x$/CF shows excellent catalytic activity for water splitting by showing 24-hour stability.