

## ABSTRACT

Currently, the increasing energy demand is accomplished by non-renewable, non-environmental friendly, and Non-affordable, sources which are not only exhausting but also creating environmental hazards. To rationalize the inexpensive, renewable, ecofriendly resources an expedition is in development. Electrocatalytic splitting of water is a sustainable and eco-benign approach for energy conversion and production zone that eventually addresses the overall fossil fuel reliance. Herein, we report a simple method for fabricating the self-supported Ni bimetallic MOF/NF electrocatalyst for water splitting. The synthesized electrodes were comparable with standard electrode available in the market and the results proved that the electrodes are stable and efficient towards HER and OER as they attained the current density of 20 and 50 mAcm<sup>-2</sup> at rather low overpotentials 223 and 137 mV overpotentials in 1 M KOH electrolytic solution. The high electrocatalytic activity is ascribed to the structural superiority, the greater number of active sites, high surface area, and synergistic effect of Ni and Co metals. The reported scheme presents a novel method for fabricating Ni bimetallic MOF/NF electrocatalyst for the electrochemical energy conversion process.