

Preparation of Ag-Doped and MOFs Coupled-LaFeO₃ Nanosheet for Electrochemical CO₂ Conversion

Authors : Iltaf Khan, Munzir H. Suliman, Muhammad Usman

Abstract : The rapid growth of modern industries has led to increased energy demand and worsened fossil fuel depletion, resulting in global warming, while organic pollutants pose significant threats to aquatic environments due to their stability, insolubleness, and non-biodegradability. So, scientists are investigating high-performance materials to resolve these issues. In this study, we prepared LaFeO₃ nanosheets (LFONS) employing a solvothermal method via a soft template such as polyvinylpyrrolidone (PVP). The LFONS have good performance regarding surface area and charge separation as compared to LaFeO₃ nanoparticles (LFONP). To improve the efficiency of LFONS, it was further modified with Ag and ZIF-67 and utilized for CO₂ conversion. Herein, the results confirm that Ag-doped and ZIF-67 coupled LFONS (ZIF-67/Ag-LFONS) exhibit superior performance compared to pristine LFONP. In addition, the stability tests confirm that our optimal sample is the most active and stable one among various nanocomposites. Ultimately, our studies will open a new pave for cost-effective, eco-friendly, and electroactive nanomaterials for CO₂ conversion.

Keywords : LaFeO₃ nanosheets, Ag incorporation, MOFs coupling, CO₂ conversion

Conference Title : ICMSE 2024 : International Conference on Materials Science and Engineering

Conference Location : Melbourne, Australia

Conference Dates : February 01-02, 2024