World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:18, No:02, 2024

Preparation of Ag-Doped and MOFs Coupled-$LaFeO_3$ Nanosheet for Electrochemical CO_2 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 $LaFeO_3$ 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 $LaFeO_3$ nanoparticles (LFONP). To improve the efficiency of LFONS, it was further modified with Ag and ZIF-67 and utilized for CO_2 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 CO_2 conversion.

Keywords : $LaFeO_3$ nanosheets, Ag incorporation, MOFs coupling, CO_2 conversion
Conference Title : ICMSE 2024 : International Conference on Materials Science and Engineering
Conference Location : Melbourne, Australia
Conference Dates : February 01-02, 2024