22nd Iranian Inorganic Chemistry Conference,
23-25 August, 2023
University of Kurdistan

Green Synthesis of Zinc Oxide with Hydrochar by lavandulifolia Extract and development of hydrogen storage capacity

Maedeh Koohi[a], Maryam Shaterian[b]*

[a,b]*Department of Chemistry, Faculty of Science, University of Zanjan, Zanjan, Islamic Republic of Iran*

[*] *E-mail: shaterian@znu.ac.ir*

In recent years, the environment has become seriously polluted as a result of the growth of industries. Polluted water sources have become a critical concern as a result of human activities, and different industrial operations have discharged organic contaminants that can cause carcinogenicity and toxicity in aquatic ecosystems [1]. In light of this, water purification has been regarded as an effective method of reducing pollution and water shortages. A number of traditional water treatments, including adsorption [2], ion exchange [3], biological processes [2], and membrane [4], have been developed in recent years. The goal of this study is to produce environmentally friendly nanomaterials that have a high hydrogen storage capacity(1). The researchers in this study used inexpensive material to produce hyrochar and a green solution synthesis combustion method to produce ZnO nanoparticles and nanocomposite using a Stachys lavandulifolia extract as the source material. Metal oxides such as ZnO are used to increase hydrogen storage capacity. Hydrochar and Hydrochar/ZnO nanocomposites have been confirmed via XRD (X-ray diffraction), SEM(scanning electron microscopy, FT-IR (fourier transform infrared. In terms of discharge capacity, ZnO, Hydrochar/ZnO display respective capacities of 220, 500 mAh/g after 4 cycles, respectively. Of all the sample materials, the Hydrochar/ZnO nanocomposite with the highest hydrogen storage capacity has.

.

Keywords: Hydrochar/ZnO, nsnocomposite, Hydrogen storage

References

[1] VN. Kalpana, V. Devi Rajeswari, *Journal Bioinorganic chemistry and applications*, **2018**, 1, 20.
[2] Y. Liu, H. Wang, X. Yu, S. Chen, et al, *Journal Chemical Engineering*, **2021**, 406, 127139.
[3] RA. Gonçalves, RP. Toledo, *Journal Molecules*. **2021**, 26(8), 2236.
[4] VN. Kalpana, V. Devi Rajeswari, *Journal Bioinorganic chemistry and applications*. **2018** ,1, 208.