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

Dye removal from aqueous solution using ferrite-based nanocomposite in the photocatalytic process

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Lack of pure water is the one of the major barriers in the global socio-economic development. The industrial discharge and other human activities release different kinds of chemicals into the natural environment, contaminating available resources of water [1]. Dyes are one of the largest polluting groups of textile wastes and other industrial processes. Due to the adverse effects of organic dyes on human health, several technologies have been used to treat dye-containing wastewaters, including coagulation- flocculation, biological treatment, electrochemical treatment, membrane filtration, ion exchange, absorption, chemical oxidation, and advanced oxidation processes. Photocatalytic oxidation is one of the effective and well-known techniques for reducing the negative effects of environmental pollutants [2]. The photocatalytic process involves the acceleration of a chemical reaction in the presence of substances called photocatalysts, which can absorb quantum light with the appropriate wavelength, according to the band structure of their orbitals. In this research, the efficiency of $MgFe_2O_4/MoS_2$ nanocomposite in the photocatalytic oxidation of acid blue 113 dye was investigated. The effects of three parameters, including contact time, pH value and the amount of catalyst on the dye degradation were studied. The optimum conditions for degradation of 20 mg/l acid blue113 were found at 10.07 min, and catalyst dose of 20.95 mg under visible light irradiation. The results show that by photocatalytic oxidation process using the synthesized nanocomposite, 93.91% of the dye degradation can be achieved.

***Keywords*:** Nanocomposite; Acid Blue113; Optimization; Wastewater; Photocatalyst

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