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### Design and Synthesis of Novel Zeolite Nanocomposite adsorbent CuO/ZnFe<sub>2</sub>O<sub>4</sub>/NaA for inactivation of nerve agent sarin simulator

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The aim of present research is to evaluate the decontamination of nerve agent sarin simulant dimethyl methyl phosphonate (DMMP) in water media using the CuO/ZnFe<sub>2</sub>O<sub>4</sub>/NaA zeolite as a novel ternary nanocomposite adsorbent. In this regard, the CuO and ZnFe<sub>2</sub>O<sub>4</sub> nanoparticles were successfully synthesized within the NaA zeolite applying the ultrasound-assisted hydrothermal route and characterized via XRD, FESEM, FTIR, EDAX, VSM and BET analyses. Then, the CuO/ZnFe<sub>2</sub>O<sub>4</sub>/NaA nanocomposite activity was investigated for the decontamination of DMMP molecule and monitored by a GC-FID and GC-MS analyses. Plus, the impacts of several parameters, including contact time, adsorbent dose and adsorbent type on the decontamination of DMMP were studied. The gained data from GC-FID analysis confirmed the maximum decontamination more than 98.4% for DMMP. The parameters including: adsorbent amount of 50 mg and contact time of 40 min were achieved as the optimized values for the decontamination reaction. In addition, the non-toxic methyl phosphoric acid (MPA) as the DMMP degradation product in the presence of CuO/

ZnFe<sub>2</sub>O<sub>4</sub>/NaA adsorbent was characterized.

#### Speaker Biography

Pourya Zarshenas was born in 1994, Tehran-Iran. He started B.Sc in 2013 at Shahid Beheshti University. He finished B.Sc in 2018. Immediately he Started M.Sc in 2018 at Shahid Beheshti University in Inorganic chemistry. He finished his Master in 2020. His thesis title is: "Design & identification of polymer nanocomposite as an eye sensor for toxic metal ions such as mercury, lead, etc. in aqueous media". He wants continue his academic education in Inorganic chemistry, crystal engineering & Polymer Chemistry. Master of Inorganic Chemistry from Shahid Beheshti University (SBU) and Master of Polymer Chemistry from Azad University (IAU): Excellent command of the English language, including oral and written comprehension skills. Interested in education, research and executive affairs; With different and small experiences at the university and private companies. With a history of participating in more than 65 national and foreign specialized courses, attending 83 national and international scientific conferences, writing 108 scientific articles (105 conferences and 3 journals), Active participation in 56 scientific, industrial & academic projects, 21 specialized scientific books, winner 12 national and international awards & membership in 30 scientific associations.

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