

# Using magnetic modified Azolla Powder for removal of Reactive yellow aqueous solution

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**Abstract:** Azolla has been imported to Iran for the purpose of Nitrogen fixation and production of more crops. But today, the fern itself has turned into an environmental problem. Shortage of water resources in recent years has caused more attention to be given to new methods of filtering water wastes and reusing them. In this research, Azolla was used as a natural and inexpensive absorbent for elimination of reactive yellow pollutants in water environments. For this purpose, a sufficient amount of Azolla was gathered, washed and dried; then, it was powdered. For modification Surface and magnetization of Azolla powder, chemical precipitation methods were used to synthesize iron nanoparticles Fe<sub>2</sub>O<sub>3</sub> on Azolla powder. For synthesis of iron nanoparticles Fe<sub>2</sub>O<sub>3</sub> on Azolla powder, first, a certain amount of the powder was poured into a solution of ammonia. Then, a solution of salt, Iron II and Iron III was added to the sample, drop by drop, under 80-90 degrees Celsius. Then, the size and structure of the magnetized Azolla powder was examined through the FT-IR, SEM Spectrometer. The effective variables in elimination of reactive yellow, such as pH, Ionic strength, the solution stirring time and the absorbent's weight were examined through taguchi experimental design. According to the results, the optimum condition was as follows: pH=2, Ionic strength=0, volume of the solution=25 ml, stirring time=10 min, and absorbent's weight=0.15 gr. The absorption kinetics of reactive yellow was examined. The results reveal that dye absorption's following to Pseudo second Kinetics, which shows the chemical absorption of reactive yellow on the absorbent. The result of isotherms showed that absorption reaction follows the Freundlich model. Results show that magnetized Azolla powder, as an absorbent of dye pollutants, is not only natural, but also highly effective. Low cost and reusability of magnetized Azolla powder for a few times, as well as, its ability in fast elimination of soluble dye pollutants are among the advantages that have made it useful

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**absorbent for eliminating dye pollutants.**

**Keywords : Key words: Azolla, Magnetic nanoparticles, Adsorption, Fe<sub>2</sub>O<sub>3</sub> nanoparticles, reactive yellow**

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