Application of magnetic polymeric nancomposite for preconcentration and simultaneous spectrophotometric determination of dye pollutants in water by multivariate chemometrics method

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Magnetic separation technique has the potential to achieve environmental separation by selectively removing target toxic compounds from the background of complex matrices. A host of commercially available and/or tailored polymeric sorbents exhibit specific affinities toward a wide array of dissolved environmental contaminants. They are, however, nonmagnetic. Thus, they do not respond to magnetic field. Magnetically active polymeric particles (MAPPs), thus prepared, offer new opportunities for enhanced separation in complex environmental systems.A simple and rapid analytical method for the determination of trace levels of textile industry cationic dyes in water is presented. In this study initially, transform nonmagnetic polymeric particles into super paramagnetic ones by precipitation magnetite crystals within the polymer phaseThen, the dyes were preconcentrated from of water samples with solid-phase extraction using polymeric cation exchangers sample previously modified with a ferrit. The modified polymeric cation exchangers exhibited an excellent extraction for the dyes from solution. The parameters that influence quantitative recovery of cationic dyes like volume of eluent solution, time (Desorption , Absorption),PH, and dosage of adsorbent were varied and optimized. After elution of the adsorbed dyes, the concentration of dyes was determined spectrophotometrically with the aid of chemometric methods without separation of dyes.

References

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