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Extended Abstract

Green Synthesized Silver Nanoparticles as Multifunctional Materials for the Degradation of Different Dyes †

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Silver nanoparticles, widely known for their antimicrobial, antioxidant, and antifungal properties, can be obtained using conventional or unconventional methods and have various applications in different scientific fields, including degradation of dyes from the textile industry [1,2]. This paper describes the one-pot green synthesis of silver nanoparticles (AgNPs) from three different plants (Sea buckthorn, Ramson, and Cornflower) and their potential use in the degradation of some azoic dyes. The three plants (Sea buckthorn, Ramson, and Cornflower) were used to prepare the aqueous extract at room temperature for 24 h. A qualitative and quantitative screening of bioactive components was carried out using standard analytical techniques, and the aqueous extracts were used for the green synthesis of AgNPs at room temperature and at 50 °C. In order to confirm the formation of the AgNPs, UV–Vis, FTIR, DLS, and SEM spectra were recorded. Also, their antioxidant activity was determined and their potential use in the degradation of some azoic dyes was investigated. The qualitative screening of phytochemicals revealed a positive response for saponins, carbohydrates, alkaloids, etc., making them an excellent natural material for the green synthesis of AgNPs. The UV–Vis spectra were recorded at different time intervals and exhibited peaks at 435 nm (Sea buckthorn), 442 nm (Ramson), and 452 nm (Cornflower). FTIR measurements allowed the determination of major functional groups present in the structure of the AgNPs (e.g., C=C, C=O, C–H, etc.). This paper presents the green synthesis of silver nanoparticles (AgNPs) from three different plants (Sea buckthorn, Ramson, and Cornflower) and their physical-chemical characterization using UV–Vis, FTIR, DLS, and SEM. Also, preliminary studies were carried out to investigate their potential use in the degradation of some azoic dyes.

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