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O 78. "GREEN SYNTHESIS" OF SILVER NANOPARTICLES AND EVALUATION OF THEIR CATALYTIC ACTIVITY ON REDUCTION OF METHYLENE BLUE

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ABSTRACT: Synthesis of metallic nanoparticles can be realized by various methods such as chemical vapour deposition, physical vapor deposition, microwave-assisted synthesis, sol-gel method, ultrasonication method, electrochemical synthesis and chemical reduction of metallic ions. However, these techniques are expensive, non-ecofriendly and often contain harmful chemicals. As a result of increasing interest in green chemistry and other biological processes, scientists have turned to an eco-friendly nanoparticle synthesis that is simple, affordable, compatible with biomedical and pharmacological applications. Different contents existing in plant extracts such as polysaccharides, polyphenols, aldehydes, ketones, proteins/enzymes, amino acids and caffeine can reduce metal ions and stabilize the nanoparticles to preferred sizes and shapes.

A green approach for the synthesis of silver nanoparticles (AgNPs) using water extract of *Tussilago farfara* plant under ambient conditions is reported in this study. The formation of AgNPs was analyzed by UV-visible spectrophotometer. Further, the effects of pH, temperature, and time on the formation of AgNPs were studied. From the results, it can be claimed that the formation of AgNPs mainly depends on the pH of the reaction medium. The formation of AgNPs occurs in neutral and basic pH which is evident from visual observation. Moreover, the catalytic effectiveness of the synthesized green catalyst, AgNPs, was also investigated in catalytic reduction of Methylene Blue (MB) dye. The reduction of dyestuff is confirmed by the decrease in absorbance maximum values of MB with respect to time using UV-visible spectrophotometer. The reaction was completed within 10 min, inferring excellent catalytic properties of silver nanoparticles in the reduction of MB.

Keywords: Silver, nanoparticle, methylene blue, reduction, green synthesis