Synthesis and Study of Silver Nanoparticles Using Iraqi and Indian \textit{Lawsonia inermis} Plant and their Catalytic Performance in Degradation of Organic Pollutant

Abstract- In this work, we depict the cheap, friendly environment, an unreported and easy methodology for the synthesis of silver nanoparticles using the extract of leaf concentrate of \textit{Lawsonia inermis} as a green, reducing agent. Silver nanoparticles display exclusive physical characteristics, which have appealed serious research attention due to their essential uses. In present work, silver nanoparticles were synthesized for environment uses by means of a completely green biosynthetic process using \textit{Lawsonia inermis} flowers extract (henna). The structure, as well as properties of silver nanoparticles, was investigated with UV-visible spectroscopic techniques, scanning electron microscopy (SEM), energy dispersive X-ray spectrometers (EDS) and zeta potential. The maximum peak absorption by using UV-visible spectroscopic analysis was found at 460 and 495 nm, which point to the production of silver nanoparticles. Usual slight particle diameter that is determined by SEM was found to (10-46 nm). Furthermore, zeta potential investigation shown that silver nanoparticles have good stability. EDX analysis also displays the presentation of a silver element. The methylene blue catalytic effectiveness using light (LED) with silver nanoparticles was additionally researched in catalytic degradation of methylene blue dye. Blue dye degrades 16 - 24.8% within 40 min for Iraqi & Indian henna produced better catalytic activity because of smaller particle size of silver, which is less than (10 ) nm in Indian henna.

Keywords- \textit{Lawsonia inermis}(henna); green synthesis of silver nanoparticles, degradation of Methylene Blue, zeta potential, zeta sizer, SEM-EDS.

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