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Synthesis of Silver Nanoparticle: An Analytical Method Based Approach for the Quantitative Assessment of Drug

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Abstract : Silver nanoparticle (AgNP) has been synthesized using adrenaline. Adrenaline readily undergoes an autoxidation reaction in an alkaline medium with the dissolved oxygen to form adrenochrome, thus behaving as a mild reducing agent for the dissolved oxygen. This reducing behavior of adrenaline when employed to reduce Ag(+) ions yielded a large enhancement in the intensity of absorbance in the visible region. Transmission electron microscopy (TEM) and X-ray diffraction (XRD) studies have been performed to confirm the surface morphology of AgNPs. Further, the metallic nanoparticles with size greater than 2 nm caused a strong and broad absorption band in the UV-visible spectrum called surface plasmon band or Mie resonance. The formation of AgNPs caused the large enhancement in the absorbance values with λmax at 436 nm through the excitation of the surface plasmon band. The formation of AgNPs was adapted to for the quantitative assessment of adrenaline using spectrophotometry with lower detection limit and higher precision values.

Keywords : silver nanoparticle, adrenaline, XRD, TEM, analysis
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