

EFFECT OF POLYVINYLPIRROLIDONE MOLECULAR WEIGHT ON THE SYNTHESIS AND STABILIZATION OF GOLD NANOPARTICLES IN A DEEP EUTECTIC SOLVENT

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The physicochemical properties of nanomaterials depend mainly on the synthesis method used to obtain them, which opens up prospects for innovative applications.

In the case of metallic nanoparticles, various synthesis methods exist; among the most studied are bottom-up methods using chemical reduction. On occasion, stabilizing agents and structure directors, such as polyvinylpyrrolidone (PVP), are also used. Deep eutectic solvents have emerged as non-aqueous reaction media.

This study presents the effects of PVP of three molecular weights (10,000, 40,000, and 360,000 g mol⁻¹, PVP10K, PVP40K, and PVP360K, respectively) on the synthesis of gold nanoparticles (AuNPs) in the DES formed by choline chloride (ChCl) and urea.

The synthesis of AuNPs was carried out by chemical reduction of the gold precursor, tetrachloroauric acid trihydrate (HAuCl₄·3H₂O), using L-ascorbic acid (C₆H₈O₆) as the reducing agent in the non-aqueous DES ChCl:U medium.

The AuNPs were characterized by ultraviolet-visible spectroscopy (UV-vis), scanning electron microscopy (SEM), transmission electron microscopy (TEM), and dynamic light scattering (DLS).

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