

(54) Title of the invention : Transformation of tiron into tiron-loaded silver nanoparticles as value added product for pharmacologically apt physico-chemical and biological properties

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(57) Abstract :

Nanotechnology offered synthesis of nanoparticles by unique combination of metals with natural and synthetic products for therapeutic uses with improved drug delivery. We synthesized tiron loaded silver nanoparticles (TAgNPs), and performed their physico-chemical and biological characterization to understand pharmacologically apt properties. Synthesis of TAgNPs was confirmed by change in color to golden yellow with peak range of 430-440 nm under UV-visible spectroscopy. The particle size was found in the range of 14.9-12143.7 nm with a spherical shape under electron microscopy. Crystalline phase of tiron loaded silver nanoparticles was observed by X-ray powder diffraction and thermal stability was confirmed by thermogravimetric analysis. Functional groups were validated under FTIR spectroscopy, which quantified functional groups on the surfaces of TAgNPs. The ability of TAgNPs to scavenge free radicals was evaluated with H₂O₂, DPPH and ABTS assays, which suggested its excellent antioxidant potential. In vitro cytotoxicity through MTT assay and genotoxicity through comet assay on rat lymphocytes suggested outstanding safety profile of TAgNPs. Thus, Synthesized TAgNPs have pharmacologically apt physico-chemical and biological properties and may offer as a promising agent for medicinal use against toxic manifestations in terms of oxidative stress associated disorders.

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