

Abstract

We report an experimental evidence of a process of silver particles preparation by the Tollens reduction method. Natural non toxic reducing agents, such as various starches and flavonoid plant extracts were used. As the most efficient reducing agents amaranth starch and Paulinia cupana extract were choosen for the following study. The use of starches alone leads to highly polydisperse systems. The mixing of starches with Paulinia cupana extract results in silver nanoparticles with good size-mean and size-distribution parameters. The nucleation and growth phase of the particle preparation process were improved by the microwave irradiation. The synergy of intensified molecular movement in the water phase and the similar and more thermal accented process in the newly formed metal nanoparticles were exploited. This preparation method evidently leads to the higher quality systems usable as biocompatible antimicrobials and preservatives.