

A Simple Statistical Approach for Synthesis of Silver Nanoparticles in Concentrated Solution

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The final aim of this work is to obtain uniform and highly dispersed silver nanoparticles. We studied here the key factors to obtain the Ag nanoparticles in concentrated solution required for above aim and identified the optimal conditions. It has potential applications in inkjet printing and various electronic devices. We have performed the experiments based on 2k-factorial DOE(Design of Experiment) along with the factors suggested by Matijevic. The obtained nanoparticles were analyzed for the mean particle size, distribution and aggregation state with SEM, TEM, UV-Visible Absorbance. Finally the dependence of the factors and the experimental results were analyzed and optimized using MINITAB, a statistical software. The particles size could be controlled in the range of 20nm to 120nm by changing the above factors. The model proposed by the above results matches well with the experimental result. The statistical approach allows one to predict the optimal condition for the synthesis of silver nanoparticles by chemical method.