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EFFECT OF TEMPERATURE AND NaCl CONCENTRATION ON SYNTHESIS OF SILVER NANOPARTICLES PREPARED IN AQUEOUS MEDIUM

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ABSTRACT

Unique optical and physical behaviour of nanoparticles compared to corresponding bulk materials has gain considerably interest and the research in synthesizing and application of nanoparticles has expanded rapidly over a last decade. This present study reported on the well-dispersity synthesis of nano-size material via chemical reduction of silver nitrate ($AgNO_3$) by sodium borohydride ($NaBH_4$) in an aqueous medium. In this study, there are two parameters that were manipulated which are temperatures; varied from 25 °C until 90 °C and concentration of sodium chloride (NaCl) that was varied from 0.0mM to 30.0 mM respectively. The UV-Vis analysis of silver nanoparticles shows maximum peak were determined at the range of 404nm- 410 nm which is the characteristic of Ag particles. Meanwhile, the morphology of as-synthesized silver nanoparticles (AgNPs) that investigated by using Field Emission Scanning Electron Microscopy (FESEM) reveals a spherical particles size with the size range of 20 nm-160 nm. Analysis of AgNPs diameter by using Image J reveal that the smallest nano-size AgNPs is at 3.0 mM NaCl and at temperature 45°C which is ~50 nm.

Keywords: silver nanoparticles, temperature, sodium chloride, silver nitrate, concentration.