ABSTRACT

Citrate reduction was done for preparation of colloidal silver nanoparticles of different sizes. This was followed by coating with polyacrylic acid polymer to prevent agglomeration. The prepared nanoparticles were used to study the bactericidal activity in *E.coli* and *Bacilus subtillis.* Nanoparticles of low concentration and smaller size are found to be more effective in killing bacteria. The in-vitro tissue damaging activity of the nanoparticles was tested and was found to be less toxic. The immobilization of α-amylase on nanoparticles was done by carbodiimide activation process. Among the tested buffers Tris-Cl, pH 8.5 was found to be the best buffer system for immobilization. UV-visible data analysis confirmed the formation of nanoparticles and SEM analysis had shown that nanoparticles had a size range of 60-80 nm. FT-IR study confirmed the binding of the crude α-amylase on silver nanoparticles.

Key words: α-amylase, citrate reduction, colloidal silver nanoparticle, bactericidal activity, and enzyme immobilization.

OBJECTIVES

1. Preparation of silver nanoparticles of different sizes.
2. Characterization of the synthesized nanoparticles by biophysical methods such as; UV-Visible spectrophotometer, Scanning electron microscope, FT-IR spectrophotometer.
3. Study the effect of size on bactericidal activity and in-vitro tissue damaging activity.
4. Immobilization of crude α-amylase enzyme onto silver nanoparticles.