

## ABSTRACT

*Chitosan is a material with antibacterial properties. Chitosan modification with cinnamaldehyde produces a Schiff base chitosan that acts as a capping agent in the synthesis of silver nanoparticles. The Schiff base product is further modified to create a composite Schiff base silver nanoparticle that enhances its capping agent ability and antibacterial properties. This research aims to synthesize the composite Schiff base chitosan-cinnamaldehyde/AgNP (BSKS/AgNP) as an active material with good antibacterial ability, capable of inhibiting bacterial growth. The first method involves synthesizing the chitosan-cinnamaldehyde Schiff base. In the second method, chitosan/AgNP composite synthesis is conducted by adding STPP with heating and sonication. In the third method, BSKS/AgNP composite synthesis is performed using the same method as in the second step through heating/non-heating and sonication/non-sonication. Product characterization includes UV-Vis spectrophotometry, FT-IR, SEM-EDX, and AAS. Antibacterial testing is carried out on the synthesized products using the Total Plate Count (TPC) method. Chitosan has a molecular weight of 338080 g/mol and a degree of deacetylation of 65.09%. The chitosan-cinnamaldehyde Schiff base product is a brownish-yellow solid with a 76.9% yield (w/w) and a DS of 87.02%. The chitosan/AgNP product has a 97% yield (w/w) and exhibits SPR at 439 nm. The synthesis of BSKS/AgNP results in a dark green solid with an 87% yield (w/w) and exhibits SPR at 433 nm. The antibacterial activity test shows the highest percentage reduction in bacterial count for BSKS/AgNP after 3 days at 95.1% (1000 ppm) and 96% (2500 ppm), and after 7 days at 94.1% (1000 ppm) and 95.1% (2500 ppm).*

*Keyword : chitosan, Schiff base, antibacterial, silver nanoparticle*