

OPTICAL PROPERTIES OF ELECTROSPRAYED CHITOSAN AND CHITOSAN-AGNP FILMS

S. Oluwagbemiga Alayande*¹, T. Victoria Adeselu², Akinsipo Oyesolape Basirat³,
John A. Ajao^{1,2}, Bolarinwa R⁴

1. Centre for Energy Research and Development, Obafemi Awolowo University, Ile Ife, Osun State.
 2. Department of Physics and Engineering Physics, Obafemi Awolowo University, Ile Ife, Osun State.
 3. Department of Chemistry, College of Science and Information technology, Tai Solarin University of Education, Ijagun, Ijebu ode, Nigeria.
 4. Department of Physics Electronics, Fountain University, Osogbo, Nigeria.
- Corresponding: * gbengaalayande@gmail.com, +2348038356893

ABSTRACT

Among the novel families of biological macromolecules, whose relevance is becoming increasingly evident is chitosan. Important properties are biodegradability, anti-microbial and non-toxic nature. In this study, optical properties of chitosan and chitosan-AgNP was investigated as potential coating for membrane and medical devices. Chitin was extracted from Snail shell and deacetylated to chitosan. Chitosan and chitosan-AgNP were dissolved in organic acids then electrospayed at 8 Kv on glass substrate. The optical properties of the films were studied using UV-Vis. Spec., Tauc's equation and optical microscope. From the result, at 350-380nm; hypochromic effect was proportional to the quantity of silver added. Plasmonic effect predominate in the near to far visible region, further increase in quantity of silver resulted to enhance absorbance in visible region. Ability of Chitosan and chitosan-AgNP films to absorb in the ultra violet regions shows transmission of ultra violet light, this presence a membrane coating material with enhanced antimicrobial property. Furthermore, photon energy band gap was between 4.1-4.3 eV: insulating material, while micrographs show uniform deposition. Therefore, optical properties of electrospayed Chitosan and chitosan-AgNP films revealed great potential as coating for membranes and medical devices.