

8th World Congress on

Biopolymers & Bioplastics

June 28-29, 2018 | Berlin, Germany

Designing of polysaccharide based nanobiocomposites as packaging applications

Prof. Sarat K Swain

Veer Surendra Sai University of Technology, India

Recently, polymer nanocomposites are considered as suitable alternatives to conventional materials (like metal, ceramic, and paper) in packaging application due to their functionality, light weight, ease of processing, and low cost. Most materials, currently used for packaging are non-degradable, generating environmental problems. Due to this problem, biopolymers have been exploited to develop materials for eco- friendly packaging applications. Polysaccharide based nanobiocomposites are prepared with incorporation of different layered nanostructures in polysaccharides matrix. The interaction between polysaccharide and layered nanostructure is studied by Fourier transform infrared spectroscopy (FTIR). The structures of nanobiocomposites are investigated by XRD [Figure 1(a)], FESEM, and HRTEM [inset of Figure 1(b)]. The quantitative identification of nanobiocomposites is performed by selected area electron diffraction (SAED) pattern. Thermal stabilities of the prepared nanobiocomposites are measured by thermo gravimetric analysis (TGA) and it is found that thermal stability of the nanohybrids is higher than the virgin polymer. The oxygen barrier property of biopolymer based nanobiocomposites is measured using a gas permeameter and a substantial reduction in oxygen permeability is observed with increasing the loading of layered nanostructures [Figure 1(b)]. This may be attributed from the typical arrangement of layered nanostructures in polymeric network which provide a longer path-length for the upcoming gas molecules. Further it is noticed that the chemical resistance of the nanobiocomposite is more than the neat polymer. Hence, the prepared nanobiocomposites may be widely used as eco-friendly packaging applications.

swainsk2@yahoo.co.in