PS 5 - Physico-chemical Characterization of Chitosan from Fungi and Crabs

T.L.M. Stamford[(1)], T.C.M. Stamford[(2-3)], T.M. Stamford[(4)], P. Santa Cruz[(5)], A. Rosenblat[(2)], G. Campos-Takaki[(3,6)]

[(1)]University Federal of Pernambuco. Av. Prof. Moras Rego, s/n. Cidade Universitária 50670-420, Recife, PE, Brazil – [(2)]University of Pernambuco State, Brazil – [(3)]Nucleus of Research in Environmental Science, University Catholic of Pernambuco, Brazil – [(4)]Pos-graduation in Science Materials, Federal University of Pernambuco, Brazil – [(5)]University Federal of Pernambuco, Brazil – [(6)]University Catholic of Pernambuco, Brazil

Chitosan is a linear polysaccharide, cationic, biocompatible, obtained from the deacetylation of chitin. The physico-chemical properties and biological response of chitosan depend on several parameters including its origin (shrimp, crabs, fungi etc), on the average degree of deacetylation (DD), molar mass (M) and crystallographic properties. Several applications of chitosan have been proposed in the literature, mainly in water treatment, cosmetic and drug manufacturing, food additives, semipermeable membranes and development of biomaterials. The present work focuses on the study of the crystallographic and thermal properties of chitosan prepared from crabs and fungal sources. The chitosan samples were characterized by proton nuclear magnetic resonance (^{1}H NMR), infrared spectroscopy (IR), conductimetric titration, thermal analysis (TG and DSC) and X-ray Diffractometry in order to compare chitosan properties from different sources. Chitosan from fungi and crabs showed degree of deacetilation and viscosimetric molecular weight up to 85% DD and 2.72 x 10^4 g/mol and 70 % DD and 2.56 x 10^4 g/mol, respectively. Fungal chitosan, analyzed by X-ray diffraction, showed higher crystallinity indexes and size of the crystallites than the crabs chitosan, ascribe to reorganization of the polymer chains. The thermal analyses of chitosan samples demonstrated a process of dehydration, followed of the polymer decomposition, with generation of carbonized material. The DSC curves showed two thermal events. The first registered in all samples was a wide endothermic peak. The second event was an exothermic peak for crab chitosan and an endothermic peak for fungal chitosan. These results suggest the application of fungal chitosan in different biotechnological fields.