PC 9 - Synthesis of Na-(3-Bromopropanoyl)-amino Acids and its Binding to Chitosan

M.K.S. Batista[1,2], C.A.R. Gomes[1], P. Gomes[2]

[1]LAQUIPAI; [2]CIQUP - Faculdade de Ciências da Universidade do Porto. Rua do Campo Alegre 687, 4169-007 Porto. Portugal

Chitosan and their derivatives have been prepared by chemical modification regarding applications ranging from the food industry, cosmetic formulations or medical and pharmaceutical. We describe the synthesis of peptide substituents by standard peptide chemistry methods, starting from -amino acid tert-butyl esters. Water-solubleα3-bromopropanoic acid with peptide-chitosans were prepared using the previously synthesized substituents, Na-(3-bromopropanoyl)-valine and Na-(3-bromopropanoyl)-aspartic acid, under smooth alkaline conditions. The substituents were characterized by ^{1}H-NMR and ^{13}C-NMR. The peptide-chitosan derivatives were characterized by ^{1}H-NMR, FTIR and potentiometry. The morphology of the novel chitosan derivatives was investigated by scanning electron microscopy (SEM). The insertion of the peptide ligands was confirmed by both spectroscopies. ^{1}H NMR allowed us to determine the polymer degrees of acetylation (0.10) and substitution (0.32 for -propanoyl-aspartic γ-propanoyl-valin)-chitosan and 0.27 for N-(γN-(acid)-chitosan. The introduction of carboxyl-functionalized substituents in the polymeric structure of chitosan yielded novel polymers that are soluble in a very wide pH range, which undoubtedly widens the scope of application of chitosan-based materials.