

PC 2 - Mass Spectrometry of Oligochitosans

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Chitosan might be the most useful form of chitin. Carefully performed deacetylation process should not affect too severely the molecular size of this polymer. The molecular weight of chitosan is usually determined from viscosity or chemical determination of terminal groups. However, the much lower molecular size of chitosan hydrolyzed to oligo forms could be analyzed very precisely by mass spectrometry. Such polyglucosamine chain does not go instantly to ionized form as peptides usually do. Standard matrices used in MALDI TOF type spectrometry as sinapinic acid, α -cyano-4-hydroxycinnamic acid or 2, 5-dihydroxy-benzoic acid (DHB) are not too efficient in ionization of polyglucosamine. Mass spectrum resulting from DHB does not show clear molecular ions. When we tried to confirm fluorescein attachment to oligochitosan via a thiourea link, we obtained an unexpectedly clear spectrum of the polymer. We believe that the presence of attached fluorescein or an excess of uncoupled fluorescein isothiocyanate may function as a matrix in the mass spectrum ionization process. We think that fluorescein could be used as a matrix additive with such polymers as polysaccharides. MALDI TOF mass spectrometry with fluorescein additives as matrix could be the best available technique to determine precisely the molecular weight of oligochitosan. In recorded spectra there is clear visible and precise mass distribution different by amino sugar unit mass.