

Abstract

Title of thesis:

Adhesive and rheological properties of chitosan-based mixtures in media of different pH

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The aim of the diploma thesis is the study of rheological and adhesive properties of tableting materials for matrix tablets based on chitosan. The theoretical part describes in detail the materials used to prepare the matrix tablets, which were chitosan, sodium alginate and hypromellose. The experimental section was focused on the flow and adhesive properties of the chitosan-based mixtures after exposing them to a media of different pH. The flow tests were done on an absolute rotational rheometer. Obtained viscosity curves were analysed by Power law model. Viscosity at 10 s^{-1} and Power Law model coefficients were used to evaluate and compare the flow behaviour of dispersions with different concentrations of retarding component in different media. The test of adhesion was carried out using a pull away test on a rotational rheometer and evaluated as maximal detachment force. The remarkably high viscosity of 5% dispersions at pH 1.2 is due to the dissolution of chitosan, as sodium alginate is not soluble in acidic media. The increase in viscosity with the concentration of the retarding component is insured by hypromellose. A 20% dispersion of tablet mixtures in a medium is more suitable for testing. Higher concentrations better reflect the conditions in the intestine where there is less fluid. In subsequent tests, it will be desirable to first expose the tablets to an acidic environment, immediately to bring them to pH 6.8 and only then measure the viscosity and adhesion.

Keywords: matrix tablet, chitosan, sodium alginate, hypromellose, viscosity, adhesion.