ABSTRACT

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Title of Thesis: Preparation of spray-dried powder containing different amount of chitosan

The aim of the thesis is the preparation of spray-dried particles, evaluation of their properties and assessment of the influence of different amounts of chitosan on the evaluated properties. The particles were prepared from a suspension of chitosan in meloxicam solution with the addition of sodium lauryl sulfate as a surfactant. The suspensions contained different amounts of chitosan (12.5; 10; 7.5 or 5 g) and meloxicam (62.5; 50 or 37.5 mg), the amount of sodium lauryl sulfate was uniform for all suspensions (7.5 g). All suspensions were dried at 190 °C.

Optical microscopy, scanning electron microscopy (SEM), differential scanning calorimetry (DSC) and dissolution tests with spectrophotometric evaluation were used to evaluate the properties of the dried samples and their particles.

The prepared particles had an irregular spherical shape and occurred independently and in clusters. Some of the particles were hollow and there were smaller particles inside their cavities. The shape and structure of the dried particles were not affected by the amount of chitosan in the sample. Dehydration, melting points, decomposition and degradation peaks were observed on DSC thermograms. Due to spray drying, the melting point of meloxicam decreased by up to 63.3 °C compared to the melting point of undried meloxicam. Dissolution tests showed higher drug release in dried samples than in undried meloxicam. For samples with less chitosan, drug release was rapid and uneven. In contrast, for samples with larger amounts of chitosan, the release was slower and more uniform.