Abstract

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Title of Thesis: The effect of solvent on disintegration time of liquisolid systems in the form of capsules

According to the literature, the resulting liquisolid (LS) powders may be formulated into the form of tablets, pellets or hard gelatine capsules. However, the available resources about liquisolid systems do not consider possible interactions between the used excipients and capsule shell. Carriers can adsorb the water from the gelatine capsule and hence cause its brittleness, while the solvent can penetrate the capsule shell and thereby affects its integrity and properties. For these reasons, LS capsules containing mixtures of the carrier Neusilin® US2 (NUS2) with different amounts of propylene glycol (PG), polysorbate 80 (PS 80) or the cyclosporine A (CysA) dispersions in these solvents were prepared and tested. The disintegration time in three dissolution media, differential scanning calorimetry (DSC) and infrared spectroscopy (IR) were evaluated to study the changes in the capsule properties.

The obtained results showed that the disintegration time of LS capsules was prolonged compared to the capsules containing only NUS2. The addition of PG and PS 80 increased the disintegration time, that was more pronounced for PG. However, the solvent amount did not affect the disintegration time. The addition of CysA caused further prolongation in capsule disintegration, whereas the effect of the model drug was more evident for the dispersions with PG. In addition, capsules containing PG or PG dispersions showed a change in the structure (softening) during the storing, which was probably caused by solvent absorption. These changes were also confirmed by IR and DSC. Even though the effect of storage on the capsules was observed, all tested capsules fulfilled the pharmacopeial limit for the disintegration time (30 minutes).