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Stability investigation of drug-cyclodextrin inclusion complexes

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Inclusion complex formation with cyclodextrins is among the most commonly known possibilities to improve the bio-availability of drug components. By using this special host-guest interaction, (where the CDs are the hosts) the chemical stability of the active ingredients can be increased and at the same time the disadvantageous side effects can be reduced.

CD inclusion complexes of 7 drugs (e.g. analgesic, antibacterial, diuretic, anti-hypertensive and anti-arythmic compounds) have been prepared with alpha-, beta- and gamma-CDs using kneading and suspension methods.

Thermal analysis and coupled techniques as TG-FTIR spectroscopy, TG-MS, X-ray powder diffraction, scanning electron microscopy were used for the solid state characterisation of the putative complexes. Supplementary studies have been carried out by hot-stage microscopy and molecular modelling.

By the comparison of the thermoanalytical curves of mechanical mixtures and the solid preparates, the presence of inclusion complexes could be verified, moreover the best parent CD and preparation technique could be selected. The comparative thermoanalytical studies on the complexes right after their preparation and after one year of storing under normal conditions gave useful information about the thermal stabilities of the formed inclusions.

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