Evaluation of the solid state form of tadalafil in sub-micron thin films using nanomechanical infrared spectroscopy - DTU Orbit (11/10/2019)

Assessing physical stability of drugs is important both in the development as well as in the production phase in the pharmaceutical industry. We used nanomechanical infrared (NAM-IR) spectroscopy based on photothermal response of a nanomechanical resonator, to investigate the solid state forms of tadalafil (TAD), under various storage conditions in sub-micron thin films. The amorphous TAD was stable, when kept at normal storage conditions of 24°C, 45% relative humidity (RH) and shielded from light, however, it crystallized after four days when it was at stress storage conditions (40°C, 70% RH, and direct sunlight). Additionally, we found that the signals recorded with NAM-IR were comparable with the attenuated total reflectance Fourier transform infrared spectroscopy (ATR-FTIR) and that NAM-IR proved to be a suitable and time efficient method when evaluating TAD in sub 500nm layers.

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