MS33-P08 | About the polymorphism of two anti-inflammatory drugs within thin films

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Investigations on polymorphism play an important role in different fields like materials science, pharmaceutics etc. Specifically, the capability of different molecules to form polymorphic structures in the vicinity of surfaces appears to be essential in finding new structures of distinct properties. In pharmaceutics, new polymorphs would for instance affect the bioavailability or shelf-life-time. The present work investigates two anti-inflammatory drugs in thin films: the pro-drug nabumetone and the chiral S-naproxen. Both molecules were dissolved in different solvents allowing thin films fabrication techniques like spinning or drop casting. The X-ray diffraction experiments reveal that nabumetone exists either in form 1 or form 2. Here the concentration as well as the processing speed are the selection criteria; large concentration and slow processing favor the formation of the stable form 1 with standing molecules while lower concentration and faster processing reveals form 2 with the molecules lying on the substrate surface. However, the less stable form 2 recrystallized within 2 months into form 1.

For S-naproxen, mainly form 1 appeared independent from the concentration and the processing speed with up-right standing molecules. Only the usage of chlorobenzene resulted in the formation of a new polymorph. The results allow to conclude that nabumetone is more affected by the processing than is the S-naproxen. Nabumetone changes its interaction with the surface so that in form 2 molecules tend to stronger interactions, and the molecules lie down. For S-naproxen the solvent-drug-interaction is more relevant rather than the kinetics like in the case of nabumetone.