

Microscale Slurry Experiments to Investigate Stability of Polymorphs and Hydrates

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For the investigation of the relative stability of polymorphs or hydrates often slurry experiments are performed in various solvents or solvent mixtures at different temperatures.

The interest in such slurry experiments is to overcome energy barriers which exist in the solid state. The results of solvent mediated conversion experiments support the understanding of the relative stability of polymorphs. In case of true polymorphs the temperature at which conversion between the polymorphs occur is the most interesting parameter. Whereas in the case of hydrates besides temperature also the water activity is a relevant factor. The water activity can easily be varied by using different solvent water mixtures.

Slurry experiments were typically performed manually, which implies manual preparation of samples, separation of remaining solid and sample preparation for analysis, typically XRPD, Raman, DSC or TGA.

The availability of high throughput platforms now also allows to perform such slurry experiments in a microscale format and thereby, running up to 96 experiments in parallel. The procedure and first results are presented and discussed.