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CONTINUOUS INNOVATION

INTRODUCTION
Continues advancement and rapid development of techniques operating at the nanoscale open new opportunities to revise and question commonly accepted nucleation and crystal growth theories. Atomic Force Microscopy (AFM) has been successfully involved in various aspects of active pharmaceutical ingredient (API) characterization including crystal growth, stability of solid dispersions, surface morphology, phase changes and dissolution [1]. Recent studies conducted on proteins crystallization at nanoscale show even more surprising results in a classical nucleation theory [2].

METHODS

Effect of a new form on (100) OZPN I face both in high humidity conditions and water solution. Results obtained from Peak Force Quantitative Nanomechanical Mapping Atomic Force Microscopy (PF-QNM-AFM) [4] indicate the presence of intermediate dense liquid-like phase in process of dihydrate D nucleation.

RESULTS

Geometric real-space analysis of crystal epitaxy

Geometric real-space analysis of crystal epitaxy (GRACE) [6] calculations revealed significant 2-D lattice registry between (100)OZPN and (001)$_D$ that is responsible for nucleation and epitaxial growth of dihydrate D on the surface of OZPN I.

CONCLUSIONS

Obtained information about observed nanodroplets both in water and 70% RH agrees with the two-step nucleation theory described by Vekilov and coworkers via dense-liquid droplets [2]. New form growing on (100) OZPN I face was characterised as dihydrate D by Raman spectroscopy.