Author's Accepted Manuscript

www.elsevier.com/locate/jcrysgro

Influence of Solvent Polarity and Supersaturation on Template-induced Nucleation of Carbamazepine Crystal Polymorphs

Jose V. Parambil, Sendhil K. Poornachary, Reginald B.H. Tan, Jerry Y.Y. Heng

PII: S0022-0248(16)30561-9
DOI: http://dx.doi.org/10.1016/j.jcrysgro.2016.09.058
Reference: CRYS23616

To appear in: *Journal of Crystal Growth*

Received date: 30 July 2016
Revised date: 13 September 2016
Accepted date: 26 September 2016

Cite this article as: Jose V. Parambil, Sendhil K. Poornachary, Reginald B.H Tan and Jerry Y.Y. Heng, Influence of Solvent Polarity and Supersaturation on Template-induced Nucleation of Carbamazepine Crystal Polymorphs, *Journal of Crystal Growth,* http://dx.doi.org/10.1016/j.jcrysgro.2016.09.058

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Influence of Solvent Polarity and Supersaturation on Template-induced Nucleation of Carbamazepine Crystal Polymorphs

Jose V. Parambil,[a,b,†] Sendhil K. Poornachary,[c] Reginald B. H. Tan*[,b,c] and Jerry Y. Y. Heng*[,a]

[a] *Surfaces and Particle Engineering Laboratory, Department of Chemical Engineering, Imperial College London, South Kensington Campus, London SW7 2AZ, United Kingdom.*

[b] *Department of Chemical and Biomolecular Engineering, National University of Singapore, 4 Engineering Drive 4, Singapore 117585.*

[c] *Institute of Chemical and Engineering Sciences, A*STAR (Agency for Science, Technology and Research), 1 Pesek Road, Jurong Island, Singapore 627833*

[†] *Present address: Department of Chemical Engineering, Amal Jyothi College of Engineering, Kanjirappally, Kerala, India, 686518*

* Corresponding authors: R.B.H.T. - reginald_tan@ices.a-star.edu.sg; J.Y.Y.H - jerry.heng@imperial.ac.uk

Accepted manuscript

Abstract

Studies on the use of template surfaces to induce heterogeneous crystal nucleation have gained momentum in recent years — with potential applications in selective crystallisation of polymorphs and in the generation of seed crystals in a continuous crystallisation process. In developing a template-assisted solution crystallisation process, the kinetics of homogeneous versus heterogeneous crystal nucleation could be influenced by solute–solvent, solute–template, and solvent–template interactions. In this study, we report the effect of solvents of varying polarity on the nucleation of carbamazepine (CBZ) crystal polymorphs, a model active pharmaceutical ingredient. The experimental results demonstrate that functionalised template surfaces are effective in promoting crystallisation of either the metastable (form II) or stable (form III) polymorphs of CBZ only in moderately (methanol, ethanol, isopropanol) and low polar (toluene) solvents. A solvent with high polarity (acetonitrile) is thought to mask the template effect on heterogeneous nucleation due to

Download English Version:

https://daneshyari.com/en/article/5489268

Download Persian Version:

https://daneshyari.com/article/5489268

Daneshyari.com