Prof. Alastair Florence

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Alastair Florence is Director of the EPSRC Centre for Innovative Manufacturing and Doctoral Training Centre in Continuous Manufacturing and Crystallisation. After graduating with a B.Sc. (Hons) Pharmacy (Strathclyde, 1991) he worked in pharmaceutical manufacturing with Organon before moving into research, gaining a Ph.D in Pharmaceutical Chemistry in 1997. He was appointed to a lectureship in the Dept of Pharmaceutical Sciences in 1998 and became Professor of Pharmaceutical Science in 2007. In this time he has attracted over £20M in research funding, establishing a leading pharmaceutical crystallisation and solid-state research programme. In addition to the EPSRC Centre, highlights include RCUK Basic Technology (Control and Prediction of the Organic Solid State; CPOSS) and EPSRC Science and Innovation Award in Physical Organic Chemistry programmes. He was awarded the Royal Pharmaceutical Society Science Medal in 2004, speaks regularly at national and international conferences and has published over 100 peer-reviewed papers and book chapters. He is also Conference Chair for the Academy of Phamaceutical Sciences PharmSci 2013 conference.

Research Interests

Professor Florence has expertise in crystallisation as a means to control pharmaceutical solids including polymorphism, solvate and co-crystal formation, salt selection and amorphous solids. His research includes approaches for controlling crystallisation from solution, vapour phase, melt and amorphous forms including the role of surfaces. He leads a programme exploring the formation and control of particles in continuous processes as part of the new EPSRC Centre for Innovative Manufacturing including the use of oscillatory baffled reactors. He has experience in developing new technologies for crystallisation control using automation and modelling approaches used to extend understanding of crystal energy landscapes.

Techniques for physical characterisation of pharmaceutical particles are also widely used in the group with a focus on the influence of crystallisation and subsequent processes on structure and critical pharmaceutically relevant attributes that dictate product performance. Exploitation of X-ray powder diffraction techniques for phase identification, structure determination from powder diffraction data and in-situ phase surveys using variable-temperature X-ray powder diffraction are key areas.

Representative Publications

In Situ Monitoring of Stirring Effects on Polymorphic Transformations during Cooling Crystallization of Carbamazepine. Crystal Growth & Design 2012, 12, 4821-4828.

Polymer Templating of Supercooled Indomethacin for Polymorph Selection, ACS Combinatorial Science, 2012, 14 (3), pp 155–159

Racemic Naproxen: A Multidisciplinary Structural and Thermodynamic Comparison with the Enantiopure Form. Crystal Growth & Design 2011, 11, 5659-5669.

A strategy for producing predicted polymorphs: catemeric carbamazepine form V, Chemical Communications, 2011, 47(25), 7074-7076.

Characterisation of amorphous and nanocrystalline molecular materials by total scattering, CrystEngComm, 2010, 12(5), 1366-1368.

Targeted crystallisation of novel carbamazepine solvates based on a retrospective Random Forest classification. CrystEngComm 2008, 10, 23-25.

Crystallization and crystal energy landscape of hydrochlorothiazide. Crystal Growth & Design 2007, 7, 705-712.

Search for a predicted hydrogen bonding motif - A multidisciplinary investigation into the polymorphism of 3-azabicyclo 3.3.1 nonane-2,4-dione. Journal of the American Chemical Society 2007, 129, 3649-3657.