Dr Marta Moreno Benito Biography & Abstract

Biography

Marta Moreno Benito is a Process Modelling Scientist at Pfizer Worldwide Research and Development in UK. She graduated with a BSc in Chemical Engineering degree (5 years) and an MSc in Environmental Technology degree from Universitat Autonoma de Barcelona (UAB), Spain, in 2006 and 2007. She obtained her PhD in Chemical Process Engineering at UPC-BarcelonaTech, Spain, with an FPU fellowship in 2014, in the research group of Prof. Antonio Espuña and Prof. Luis Puigjaner and in collaboration with Prof. Wolfgang Marquardt at RWTH Aachen University. Her PhD research focused on the use of mixed-logic dynamic optimisation for chemical process development and improvement. Subsequently, she completed post-doctoral research on hydrogen supply chain optimisation at University College London (UK) with Prof. Lazaros Papageorgiou, before joining Pfizer in 2016. Marta is actively working on the development of modelling tools to support solid drug product and process design using a system-based approach that predicts tablet critical quality attributes based on interconnected processing stages.

Abstract

Digital Twin of Continuous Direct Compression Line for Solid Drug Manufacturing

Continuous manufacturing and digital design are two key strategies to accelerate product development and improve product quality and process robustness in the Pharmaceutical sector. In this talk, a Digital Twin of continuous direct compression process that is part of Portable Continuous Miniature and Modular (PCMM) technology will be presented. It consists of a system-based end-to-end flowsheet model composed of feeders, Continuous Mixing Technology (CMT), feed chute, feed frame and tablet press. It was developed in gPROMS FormulatedProducts combining library models and custom equations and is connected with the PCMM automation software PharmaMV. The input data to the model is generated from routine lab analysis in process development and detailed mechanistic modelling of individual unit operations using Discrete Element Method (DEM). Some of the critical quality attributes that can be predicted with the Digital Twin are the blend composition, tablet thickness and hardness, based on formulation decisions, operating conditions and material and process parameters. The Digital Twin can help process design, optimisation and virtual simulation of new compounds and formulations through what-if simulations and Global System Analysis (GSA) from early to late stage, while reducing the experimental overhead usually necessary for product and process development.


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