

Structure of packed bed probed by Micro-Computed tomography, and Collision Guided Packing

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Abstract

The internal structure of packed beds formed by different arrangements of packings has been a subject of study for the past several decades. In this study, we have attempted to investigate the structure formed in laboratory-scale packed beds through experimentation and modeling, employing different ways of packing the bed. The structure has been measured using Micro-Computed Tomography (Micro-CT) and characterized through appropriate metrics. The “filling of the bed” has been modeled using a technique called Collision Guided Packing (CGP). Thus, this contribution combines both high resolution measurements as well as detailed particle-based models, bringing out a head-to-head comparison of the bed filling process and also how the final bed is configured (its structure). The work stands as an independent piece, but also provides the basis for a rigorous understanding of the impact of bed filling on deep hydroprocessing, wherein the bed structure is known to have a dramatic effect.

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