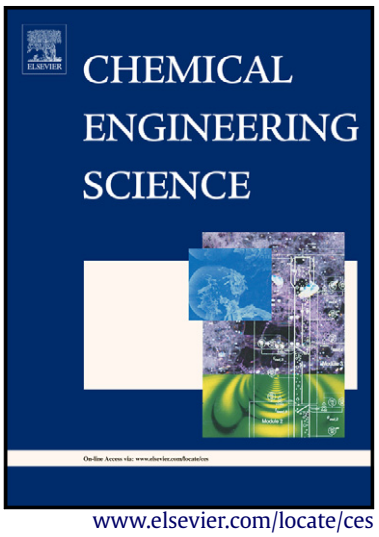


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# Numerical modeling of carbon dioxide chemisorption in sodium hydroxide solution in a micro-structured bubble column

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**Abstract**

Gas-liquid flows with solid catalyst particles are encountered in many applications in the chemical, petrochemical, pharmaceutical industries etc. Most commonly, two reactor types, slurry bubble column (SBC) and trickle bed (TB) reactors are applied for large scale in the industry. Both of these types of reactors have some disadvantages limiting their efficiencies. To overcome the aforementioned disadvantages, a novel reactor type, micro-structured bubble column (MSBC), is proposed in Jain et al. (2013). In the MSBC, micro-structuring of the catalyst carrier is realized by introducing a static mesh of thin wires coated with catalyst inside the column. Wires also serve the purpose of cutting the bubbles, which in turn results in high interfacial area and enhanced interface dynamics. Moreover, the static catalytic mesh ensures lower cost by avoiding filtration of catalyst particles.In this paper, the MSBC is numerically studied using the hybrid volume of fluid - discrete bubble model (VOF-DBM) presented in Jain et al. (2014). The

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