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Development and study of measurement methods for bogging in a fluidized bed

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Abstract

In the Fluid CokingTM process, heavy oil is contacted with hot fluidized coke particles. If the local concentration of liquid is too high, fluidization is poor, a condition commonly known as bogging. The objective of this study is to identify practical methods for early bogging detection, simulating heavy oil at coker temperatures with a lighter oil at room temperature and determining the impact of the oil concentration on bubble properties, on fluctuations of the bed pressure gradient, and on the transmission of sound through the bed. Bogging, as determined from changes in bubble properties, occurred when the oil mass fraction was increased from 0.25 to 0.275 wt%.

A Kolmogorov-Smirnov test of the wavelet coefficients of pressure fluctuations, optimised with a genetic algorithm, can detect early bogging more effectively than other methods using pressure fluctuations. A major advantage of this method is that its results are not affected by moderate

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