SIMULATION AND DESIGN OF A LIQUID FLUIDIZED BED CLASSIFIER FOR POLYDISPERSE SUSPENSIONS OF EQUAL-DENSITY SOLID PARTICLES

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Abstract. The recent model of the generalized clarifier-thickener (GCT) setup presented by Bürger, García, Karlsen, and Towers [*Comput. Chem. Eng.*, vol. 32 (2008), pp. 1181–1202.] is modified and then employed herein to simulate continuous separation and classification of polydisperse suspensions with equal-density solid particles and continuous particle size distribution, in a liquid fluidized bed classifier (LFBC), which is characterized by an upwards-directed flow of liquid at the lower end of the unit. Along with the modification of the model for the GCT setup, methodologies to design and operate a LFBC for suspensions with equal-density particles are introduced. Moreover, a novel way to discretize the particle size variable for the numerical solution of this equation is presented. Numerical examples illustrate the performance of the model and of the design and operation methodologies.

Keywords: Suspensions; Fluidization; Numerical Analysis; Simulation; Design; Operation; Classifier; Classification

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