284i On the Effect of Particle Size Distribution in Fluidized Bed Simulations

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Particle size distribution (PSD) models have become popular in recent years due to their importance in the modeling of crystallization. However, the application is not limited to solid-liquid interactions. In most fluidized bed models, the solid particles are often assumed to have a single size. Although this assumption greatly simplified the modeling effort, the size effect on particle-particle and particle-gas interactions are largely ignored. In this study, different PSD models, including discrete size model and the quadrature method of moments (QMOM) model, are coupled with drag laws to study their effects on the overall solid concentration and pressure drop. The results are compared among different PSD with similar mean diameters. The sensitivity of PSD on solid concentration and pressure drop will be analyzed and studied.