

Modelling hindered batch settling Part II: A model for computing solids profile of calcium carbonate slurry

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Abstract

This study suggests a hypothesis for determining and a model for computing suspended solids behaviour during batch settling aimed at better understanding of the settling process and more accurate and convenient determination of solids profiles. The approach is built on the graphical approach of Work and Kohler taking into account the effect of scale (i.e. initial height of suspension) on the settling of the surface of suspension. It is shown that the proposed approach includes the same information as the traditional Kynch theory of sedimentation. The proposed model, derived from the hypothesis and a model for a batch settling curve, introduces a mathematical tool for determining the solids layers and it also eliminates the disadvantage of the Kynch theory which only offers a graphical procedure for the determination. The applicability of the model was tested with calcium carbonate (CaCO_3) suspension. The experimental study proves that the model can be successfully utilised in computing the behaviour of calcium carbonate during a batch settling test.