

論文の内容の要旨

論文題目

Numerical study on an industrial die-filling simulation by
Eulerian-Lagrangian method

(オイラー-ラグランジュ法による産業用粉末金型充填の数値シミュレーション)

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Experiments and numerical studies have been popularly performed for industrial processes. Especially for numerical approaches, recently the development of numerical method is progressing faster and faster. In chemical engineering, the requirement for using simulation to predict various processes has been growing at a quick pace. Die filling is one of the important process that is widely used in many field in chemical engineering such as food production, pharmaceuticals, cosmetic, ceramics and fuel manufacture. It is the first step to produce a final tablet product. This Ph.D. thesis will be focusing on applying numerical simulations so called the Advanced DEM-CFD method on die filling process with many kinds of calculation conditions and discussing the validation and verification tests by showing the comparison between calculated results and experimental results. A detailed introduction and explanation of our numerical method will also be included. Through this series of study, the understanding of die filling process as well as the numerical modeling will be deepened. Our approach has made a substantial progress in powder technique and chemical engineering.