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Lagrange Two-Dimensional Interpolation Method for Modeling Nanoparticle Formation During RESS Process

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Abstract

In the pharmaceutical industry, a great number of products are in the form of particulate solids. Since the mid-1980s, a new method of powder generation has appeared involving crystallisation with supercritical fluids (SCF). The rapid expansion of supercritical solutions (RESS) is a promising new process for the production of small and uniform particles. Several variables can influence the RESS process: the nozzle temperature, preexpansion pressure, the nozzle diameter, and geometry. In this work, a two-dimensional Lagrange interpolation method has been proposed to describe the size of nanoparticle forming through the rapid expansion of supercritical solutions, as a function of preexpansion pressure and nozzle temperature.

Keywords: 2D-Lagrange interpolation, RESS, Modeling, Nanoparticle generation.

1 Introduction

Interest in supercritical fluids and their potential use for process improvements has significantly increased in the past decade. Some of the extraction processes such as decaffeination, and some polymerization and foaming processes have become commercial. Particle formation will most likely be the next major commercial application area that uses supercritical fluids. The particle formation technology that uses supercritical fluids has evolved

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