FLOW PATTERN ANALYSIS AND NANOPARTICLE DISPERSION IN A HIGH SPEED JET HOMOGENIZER

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Abstract

This study investigates micro channel flow pattern and operating performance of a high speed and high pressure jet homogenizer, developed by MSL/ITRI, which can be used for the dispersion and fragmentation of yellow pigment or zinc oxide nanoparticles in the slurry. Firstly, the commercialized CFD package, Fluent, is used to analyze the flow pattern in the micro channels of the homogenizer. Then, experimental results are served to verify the theoretic results. Finally, plentiful experiments for the nanoparticle processing capability using the homogenizer are performed. Through the high speed jet processing, this nanoparticle dispersion technology is verified not only its effective performance but also its mass production potential for the dispersion of the organic and inorganic particles in solution.

Keyword：High speed jet homogenizer, Dispersion, Nanoparticle, Flow pattern, Pigment.