

Prediction of wax particle size during rotating disk atomization

Qasim Imtiaz, 김도현*

한국과학기술원

(dohyun.kim@kaist.ac.kr*)

The centrifugal atomization of melts using a rotating disk is an important process for producing powder with narrow size distribution and microstructurally refined and chemically homogeneous preforms. In this study, wave theory was applied to analyze the breakup of melted wax in the film disintegration regime during centrifugal atomization using a rotating disk. The mathematical model proposed by Li and Deng ^[1] was solved numerically using Muller's method to predict the spray parameters. Film length and powder particle size were calculated and compared with available experimental data in the literature^[2], and a good agreement was achieved. The influence of the break-up parameter was studied, and it has been confirmed that the break-up parameter hardly affect the predicted powder particle size. Simulated results showed that fine powders can be produced by increasing disk size, disk speed and density of atomization environment.

Reference:

- [1] H. Li, X. Deng, Science and Technology of Advanced Materials, 8 (2007) 264-270
- [2] J. P. Cherre, A. Accary, Proceedings of 1990 PM International Conference, The Institute of Metals, London.