

# **A statistical design to evaluate the influence of manufacturing factors on the material properties and functionalities of microcrystalline cellulose.**

何秀娥,許明照

Wu JS;Ho HO and Sheu MT

## **Abstract**

The aim of this study is to statistically evaluate the effects of manufacturing factors on the material properties and functionalities of microcrystalline cellulose (MCC) products. How the material properties of MCC products dominate their functionalities was further explored. Results demonstrate that the desired material properties and functionalities of MCC products can be obtained by manipulation of the manufacturing factors using proper polynomial equations, and the key manufacturing factor is temperature. On the other hand, the functionalities can be quantitatively predicted by material properties. Meanwhile, the key material property is molecular mass in controlling MCC functionalities. The particle morphologies may also serve as important material properties. In conclusion, the careful control of temperature during the manufacture of MCC might minimize inter-batch variation. The correlation of the material properties of MCC products with their functionalities might help the formulation designer rationally select proper MCC products. The universal harmonization of MCC products might be achieved by the regulation of their molecular mass, surface roughness, and roundness.