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Jiangang Wang, Zhishan Bai, Qiang Yang, Yi Fan, Hualin Wang

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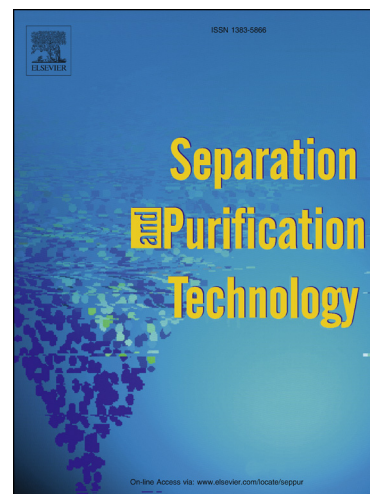
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Investigation of the Simultaneous Volumetric 3–component Flow Field inside a Hydrocyclone

*Jiangang Wang, Zhishan Bai, Qiang Yang, Yi Fan, Hualin Wang**

“State Environmental Protection Key Laboratory of Environmental Risk Assessment and Control on Chemical Process, East China University of Science and Technology, Shanghai, 200237, PR China

Abstract

The separation mechanism of hydrocyclone is elucidated by determining the three velocity components of the flow field. In this study, volumetric 3–component velocimetry measurement system was developed to investigate the three–dimensional three–component flow field inside a 35mm mini–hydrocyclone. Measurement results show the magnitude of maximum tangential, axial, radial velocity component in r-z plane of the cylindrical and cone part is about 4:2:1. The parameter n of tangential velocity in the free vortex area is fitted to be 0.5–0.7, which is a variable along axial direction. Radial velocity is non–axisymmetric, while the other two are quasi – axisymmetric. The asymmetry of the radial velocity is found to be the consequence of the existing downward progression of secondary vortices. In addition, the locus of vertical velocity was constructed in three dimensional and the shortcut flow rate was calculated using three dimensional axial velocity. These knowledge helps the further

* **Corresponding author:** Environmental Protection Key Laboratory of Environmental Risk Assessment and Control on Chemical Process, East China University of Science and Technology, 130 Meilong Road, Shanghai, 200237, PR China. Tel.:+86 21 64252748; Fax:+86 21 64251894

E-mail address: samwhl@163.com (H.L. Wang).

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