

Development of PAO (poly-alpha-olefin) Particle Generator

Hiromi Koyama and Seiji Ikawa

Sibata Scientific Technology Ltd.

1-1-62, Nakane, Soka, Saitama 340-0005

Tel: +81-489-31-1023 Fax: +81-489-31-0516 e-mail: seiji_ikawa@sibata.co.jp

ABSTRACT

DOP (dioctyl-phthalate) is used as a standard particle for the test of respirators and air filters. However, DOP is recently suspected as an endocrine disrupter. To avoid the use of chemicals of which safety is suspected, we need to find an alternative test particle with less toxicity and with suitable particle characteristics.

From such a standpoint, the technical committee of JACA (Japan Air Cleaning Association), has released "The Guideline of Substitute Materials for DOP, JACA No.37 (2001)". We developed the PAO particle generator incorporating a nebuliser, and evaluated the device on the basis of this standard. As the result, this generator generates PAO particles with average CMD less than $0.2\mu\text{m}$, with GSD less than 1.8, and at concentration higher than $30\text{mg}/\text{m}^3$. We have also studied NaCl and DOP particle generation comparatively with the same type of generators. Those generators generated NaCl particles with average CMD less than $0.1\mu\text{m}$ with GSD less than 1.8, and at concentration about $30\text{mg}/\text{m}^3$, and generated DOP particles with average CMD less than $0.25\mu\text{m}$, with GSD less than 1.6, and at concentration about $50\text{mg}/\text{m}^3$.

This result shows PAO is recommended as an alternative of DOP for the test aerosol of particle respirator filtration efficiency.