以數值模擬研究運用於氣膠粒徑分析之微分類器

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本研究是以數值模擬研究氣膠粒徑分析微分類器的設計進行探討，以期能取代傳統的氣膠採樣粒徑分析儀，諸如積分式移動度分析儀、微分式移動度分析儀等昂貴且複雜的周邊設備為目標

研究的方法為使用 CFD-ACE+數值計算模擬套裝軟體，建立力場數值分析模型，探討電場與流場拖曳力關係，以得到氣膠微粒分類最佳操縱方法，做為製造氣膠粒徑分析檢測晶片之設計模型。

由數值模擬的結果顯示，氣膠微粒分類分離可印證理論的結果，即氣膠的電移動度與氣膠粒徑成反比，其影響的參數還包括氣膠的靜帶電荷多寡、電場大小、流場拖曳力。同時由數值模擬的結果可以預期一個可操作供研究的微分類器。

關鍵字：數值模擬，粒徑分析，微分類器

The Simulation Study of Microsorter Design for Aerosol Sizing

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This research is applying numerical simulation to study the microsorter design for aerosol sizing. The goal of this study is trying to innovate a microsorter that can replace the traditional ways of aerosol sampling and analysis of particle size such as differential-mobility analyzer and integral-mobility analyzer.

The method is to create a numerical model by employing CFD-ACE+ packaged software. The aerosol will be separated when they pass through the microsorter by the competition between the drag force and electrical force.

The simulation results show that the aerosol separated and sizing agree with the theory results. The parameters that can affect the aerosol moving including the electrostatic charge, the electrical field, the drag force regarding to the fluid flow. And the results show the performable model for microsorter.

Keywords: simulation , microsorter, aerosol sizing