金屬奈米粒子粒徑校正技術
Metal Nanoparticles size calibration technology

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摘要

金屬奈米粒子因其獨特的物理性質和化學性質而被廣泛應用在各種領域，奈米粒子粒徑很小，一旦排放到環境中，要檢測到奈米粒子相當困難，若沒有適當的處理回收，將導致一些環境問題產生，所以環境中金屬奈米粒子的監控成為了重點分析的項目。由於奈米粒子獨有的特性與顆粒的大小有關，在奈米粒子的檢測中，奈米粒徑的校正尤為重要。掃描式電子顯微鏡(Scanning Electron Microscope, SEM)作為一種-非破壞性的量測方法，可以檢測樣品的形貌以及粒徑大小，因此，本研究室建立一套金屬奈米粒子粒徑量測系統，提供奈米粒徑標準之追溯校正服務，奈米尺度標準之追溯與校正，係透過標準奈米粒徑傳遞。本校正系統的評估方法參考國際標準組織（ISO）發行的 ISO/IEC Guide 98-3:2008, Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) 分析各誤差源及標準不確定度，並計算擴充不確定度。

Metal nanoparticles are widely used in various fields due to their unique physical and chemical properties. The particle size of nanoparticles is very small, and once released into the environment, it is quite difficult to detect. If they are not properly processed and recycled, some environmental problems will arise. Therefore, the monitoring of metal nanoparticles in the environment has become a key analysis project. Since the unique characteristics of nanoparticles are related to the size of the particles, the calibration of nanoparticle size is particularly important for the detection of nanoparticles. As a non-destructive method, Scanning Electron Microscope (SEM) can detect the surface topography and particle size of samples. Our laboratory uses SEM to establish a metal nanoparticles size calibration system. The uncertainty analysis of measurement results is based on “ISO/IEC Guide 98-3:2008, Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)”.

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