

Determination of ultratrace elements in photoresist solvents using the Thermo Scientific iCAP TQs ICP-MS

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To read the full app note, click here: <https://assets.thermofisher.com/TFS-Assets/CMD/Application-Notes/an-44374-icp-ms-ultratrace-photoresist-organic-solvents-an44374-en.pdf>

Introduction

Propylene glycol methyl ether acetate (PGMEA) and N-methyl-2-pyrrolidone (NMP) are the base organic solvents of semiconductor photoresists used in the production of sub- μm structures in microelectronic manufacturing. As photoresists come into direct contact with wafer surfaces, their components must be controlled for trace metal purity.

Because of its high elemental sensitivity, ICP-MS is widely used in quality control analyses of materials in the semiconductor industry. A simple ICP-MS analytical method for the direct analysis of photoresist solvents would provide a useful control for ultratrace (ng-L⁻¹) levels of analytes and avoid any contamination caused by any sample preparation.

PGMEA and NMP have historically been considered as difficult matrices to analyze directly by ICP-MS due to their high volatility (see Table 1) and high carbon content which can lead to significant polyatomic interferences.

All samples were presented for analysis using a Teledyne CETAC Autosampler ASX-112FR System (Omaha, NE, USA).