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## WHITE PAPERS & APPLICATION NOTES



### Analysis of Metallic Impurities in Organic Solvents Used in IC Fabrication With the NexION 5000 ICP-MS

**Introduction**  
Integrated circuit (IC) fabrication is a sequence of various processing steps during which chips are gradually created on a wafer made from pure semiconducting material. Silicon is widely used as a wafer, but also other semiconductor materials are used for specialized applications. Even though the fabrication takes place inside high-class cleanrooms, contaminants constitute a significant concern affecting the production yield. It is estimated that over 50% of the yield losses are due to contaminants from various sources, including process chemicals.

The most commonly used organic chemicals in the semiconductor industry are isopropyl alcohol (IPA), propylene glycol methyl ether acetate (PGMEA), propylene glycol methyl ether (PGME), and *n*-methyl pyrrolidone (NMP). While IPA is used frequently to clean silicon wafers, PGMEA and PGME are used as diluents or strippers of photoresist in photolithography steps. NMP is also a standard photoresist stripper. These solvents can leave behind an organic film, together with metallic and nonmetallic contamination on the wafers, so high-purity grades are mandated for advanced semiconductor processes.



## Analysis of Metallic Impurities in Organic Solvents Used in IC Fabrication With ICP-MS

Even though Integrated Circuit (IC) fabrication takes place inside the highly controlled cleanroom environment, contaminants from process chemicals, such as Isopropyl alcohol, account for over 50% of Integrated Circuits' production losses. Chemical producers continually strive to deliver organic solvents with lower levels of contaminants. In this application note, we look at the analyses of 46 elements in three different solvents.

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