

Online Ion Chromatography in the Semiconductor Industry: Analysis of Ultrapure DI Water

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Abstract:

This paper explains the use of Online Ion Chromatography (OIC) for ultrapure water analysis in the semiconductor industry. The instrumentation used is a Dionex DX-800 process monitoring system. Topics of discussion include calibration, multi-component analysis, multiple sampling points, detection limits, data handling, run-time reliability, and specific uses. OIC calibration occurs automatically in an enclosed environment. The calibration process internally dilutes high-concentration standards which minimizes contamination issues. OIC multi-component analysis includes boron, transition metals, silica/hydrogen peroxide, anions, and cations. The DX-800 has the ability to automatically select between 21 different sampling points through its SS-80 sample selector. Detection limits are generally in the low part per trillion (ppt) range, with some analytes detectable at less than 1 ppt. The OIC's ability to communicate with external databases minimizes manual data handling; data is collected automatically and saved to a database where it can be viewed by a customer, minimizing manual data entry mistakes. OIC reliability has a per-analyzer downtime typically less than 1 percent per year. Specific uses include resin-bed and reverse-osmosis-membrane qualifications as well as ultrapure water system troubleshooting. online Ion Chromatography has been proven to be a very effective process monitoring tool.