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Automated Preparation of Calibration Standards with DilutionStation



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## Accurately Preparing Multi-Element ICPMS Calibration Standards from a Multi-Element Stock Standard Using **Dilution**Station

## Synopsis

**Dilution**Station is an automated liquid handling system designed to streamline sample preparation tasks such as dilution, acidification, internal standard addition and mixing. This study demonstrates its capability for preparing calibration standards. With only a single push of a touch-screen-button, each day for a month **Dilution**Station automatically prepared seven ICPMS calibration standards from a 100 ppb stock standard solution. For each calibration standard an aliquot of multi-element

stock standard was taken up then rapidly diluted with 2% HNO<sub>3</sub> to a final volume of 50 mL, generating multi-element standards at concentrations of 0.5, 1, 5, 10, 20, 50 and 100 ppb. Reproducible and linear calibrations were confirmed by ICPMS analysis. By automating ICPMS calibration standard preparation, **Dilution**Station minimizes human error, reduces manual handling, and consistently delivers reliable results.



**Dilution**Station automatically prepares seven ICPMS calibration standards from a multielement stock standard. More than one stock standard can be used in cases where chemically incompatible elements are present.



Representative 7-point Cr and Sb ICPMS calibration curves automatically prepared by **Dilution**Station. A stock standard containing 100 ppb each of Cr, Ni, Co, Cu, As, Se, Cd, Sn, Sb, La, Ce, Eu, Tb, Ho, Tm, Tl, Pb, and U was diluted by factors of 200x, 100x, 20x, 10x, 5x, 2x, and 1x to a final volume in 2% HNO<sub>3</sub>.



Correlation coefficients for 30 sets of 7-point multi-element calibration curves (blank + 7 standards) for 18 elements. Each day for one month a set of ICPMS calibration standards was automatically created using a defined method accessed from the **Dilution**Station touch screen interface. The average, minimum, and maximum correlation coefficients for the 30 ICPMS calibration curves are shown. In all cases every correlation coefficient exceeded 0.9995, demonstrating **Dilution**Station automatically creates linear and repeatable ICPMS calibration standards.



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