Calibration

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1. Summary

In the context of chemical metrology, calibration is the process of relating a known quantity of an analyte to the corresponding measured instrumental response through a mathematical relationship. Calibration permits the assignment of analyte levels in unknown samples based on the known levels of the calibrants. Details of the calibration model are important to achieve accurate results. Several common approaches are used in calibrating methods. Most frequently, calibration models are based on linear instrumental response, with mathematical models that include zero intercept, fixed intercept, unconstrained (fitted), and bracketed models. When instrumental response is nonlinear, a linear model may still provide accurate results if the calibration range is sufficiently limited. This presentation will provide an overview and application of various calibration models, with recommendations of ways to improve measurement accuracy. Examples are presented that illustrate advantages and disadvantages for each of these models as applied to low level samples and to unknowns with levels that span several orders of magnitude.¹

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