

Case Study

Uncertainty sources affecting reliability of chemical measurements

Justina Dobilienė , Asta Meškuotienė, Edita Raudienė

Institute of Metrology, Kaunas University of Technology, Studentų Str. 50 - 449, 51368 Kaunas, Lithuania

 **Justina Dobilienė**
Email: justina.dobiliene@ktu.lt

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Abstract

In these latter decades, precise instrumental analysis methods and equipments can be used to determine the chemical parameters which in turn would increase the analysis efficiency by tenfold. Just part of standardized methods has full descriptions that allow get correct evaluation of final measurement result. The influence of separate stages has to be determined estimating the uncertainty of measurement result. Chemical measurements are the unique ones. The parameter that is measured with appropriate device has to be specially formed and changed to the physical one. This transformed parameter can be measured precisely. But problems appear when sample preparation that includes chemical-physical transformation is not evaluated. Then uncertainty of measurement result can increase ten times and even more. Sample preparation is still one of the most time-consuming, labour-intensive, and error-prone steps in the analysis cycle. It is still not evaluated in measurement practice enough and this is the main reason of insufficient reliability of chemical measurements.

Keywords

Nitrate in water – Uncertainty evaluation – Spectrophotometric analysis – Potentiometric analysis