

MEASUREMENT UNCERTAINTY FOR THE DETERMINATION OF ALPHA-TOCOPHEROL CONTENT BY HIGH- PERFORMANCE LIQUID CHROMATOGRAPHY

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Measurement uncertainty for determination of alpha-tocopherol was calculated. Alpha-tocopherol is determined according to SIST EN ISO 9936: 2016 method. Sample is dissolved in heptane and analyzed by high-performance liquid chromatography. Alpha-tocopherol is quantified using calibration plot. Two major contributions to measurement uncertainty were taken into account, namely bias and random error at within-laboratory reproducibility conditions. Bias has further two contributions, bias of the method and laboratory bias. The bias of the method was evaluated using model equation, taking into account all steps from the method including calibration, constructing the calibration plot, sample preparation, and sample analysis; individual contributions to measurement uncertainty were evaluated and combined. Regular analysis of a CRM (NIST SRM 3278) was used to estimate the bias of the laboratory; the uncertainty of the reference value was taken into account as well. The random error at within-laboratory reproducibility conditions was calculated using the data from control sample, analyzed in two years period. The individual contributions to measurement uncertainty were as follows: 1.70% (laboratory bias), 2.44% (bias of the method) and 1.74% (random error). The calculated combined uncertainty was 2.72% and therefore the expanded combined uncertainty with coverage factor being equal to 2 and confidential limit 95% was 5.4%.