

Automation of metrological provision of analysis result

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Abstract

Automation of the analysis result estimation processes is possible through: determination of the type of a random process, set of limit conditions, main metrological characteristics in math expression. In the paper the relevance of use the basic metrological concepts has been discussed and other definitions of these concepts have been proposed, expressed in mathematical form. The definition of "accuracy" as proximity to zero of the difference of measured and valid (true) value of the parameter is completely inadequate in terms of the definition of mathematical operations and the introduction of automatic process control. If we take the accuracy as a quantitative unit of analysis, the definition of «accuracy» as follows: accuracy takes place when insignificance of all kinds of errors, and the insignificance of the conditions should be defined mathematically. Accounting of errors interaction with technological assessment criteria as technological criteria are essential to assess the accuracy of the measurement result has been presented. One of the main problems to present the data of analysis and ensure the accuracy is a mismatch of legal and applied metrology, which then has a negative impact not only on research, but also on the production process. The ability to switch to a single metrology language not only in chemical analysis, but also in all of the measurement process is currently difficult to realize. In order to ensure the coverage, rapidity and efficiency of analysis is necessary to introduce metrology software, as well as the creation of algorithms for evaluation result of the analysis. These algorithms include an assessment on two-point or four-point scale, and are divided into educational or manufacturing processes. In this paper, we propose the algorithm for estimation analysis result on the basis of which we have created a program used in the educational process. Experimental data, obtained in the determination of lead in drinking water were evaluated. The interrelation of set of limit conditions and the metrological characteristics of the analysis and the calibration functions in the case of a linear regression analysis have been presented.

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