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## Hygroscopic gravimetric quantitative chemical analysis

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Hygroscopic gravimetric method is based on the determination of the absorbed water vapor mass by a dry sample after holding at a specific relative humidity and temperature. Theoretical bases of the methods are considered. Mass value of the sorbed water (water content) is proportional to the concentration of a heterogeneous hygroscopic impurity. Other heterogeneous hygroscopic impurities affect proportionality while water-insoluble and homogeneous impurities have no influence on water content and proportionality. Equilibrium moisture sorption of the sample due to the total effect of all the soluble impurities allows determination of the main component content in a substance. The method can be experimentally based on, holding the sample in exsiccator, isopiestic device or in dynamic vapor sorption devices. The range of the recommended relative humidity values lies within 1-5% relative humidity below the hygroscopic point (RH<sub>0</sub>) of the main component. The method is applied to determine the amorphous impurity content in a crystalline product. Application areas of the method are outlined in the paper. Attention is paid to the fact that not only water but also organic solvents can act as sorbed vapors; the objects under analysis can be both solid and gaseous substances. Employing simple experimental technique the method provides for determination of the content of the main component (from 99 to 99.999 %) and soluble impurities (from 1 to 0.001%).

### Biography

Anatoly G Tereshchenko was graduated from the Tomsk Polytechnic Institute, Chemical Engineering Department in 1969. He has obtained his PhD in 1974. Presently, he is the Head of the Information Technology Laboratory at the Institute of High Technology Physics, National Research Tomsk Polytechnic University. His scientific interests include the development of the laboratory information management system "Kimia-Analitik" (Chemistry -Analysis), quality control of the quantitative chemical analysis results within the laboratory, effect of impurities on soluble crystalline solids' hygroscopicity, caking behavior of soluble solids and isopiestic research method. He is the author of 150 articles and 2 monographs.

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