

Automated Multi-sample Moisture Sorption Analysis: Instrumental Facts and Characterization of Food Products

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This contribution introduces a new automatic multi-sample moisture device, the SPS11, revealing extraordinary features for the application in research and development of food products [1]. Many different parameters and conditions are crucial in the investigation of the moisture sorption/desorption behaviour of food products. The classical method, namely storing the samples in a desiccator over standard solutions, shows quite a number of disadvantages, such as measuring the water content of the sample outside the equilibration chamber, under conditions which differ more or less drastically from the values inside the equilibration chamber. The advantages of the SPS11, which is recording the weight changes in short intervals, are manifold. The equilibration time in moisture sorption is rather time consuming, which may be caused by the possible sample dimensions (size up to 50 mm and a thickness of up to 13 mm for the SPS11) and is also a fact of the possible sample weight with a limit of about 80 grams. The multi-sample device allows investigating 11 samples in parallel. In addition, an ideal comparison of related samples equilibrated under practically equal conditions is offered. These facts, also in regard of the high sensitivity of the balance may yield to highly reproducible measurements.

Typical applications of the device are the determination of moisture sorption isotherms and also the kinetics in reaching the equilibria. Both information are valuable for production processes of foods. Additionally, phase transformations and phase changes can lead to changes of the texture, the mechanical behaviour of the products and also induce a disaggregation.

The unique multi-sample device allows not only the adjustment and determination of the relative humidity inside the chamber with a sensor cell. However, in addition an in-process calibration during a moisture investigation of several samples may be performed with a selection of appropriate salt solutions.

The features of the instrument will be illustrated by studies, which are relevant for the research and the development of food products.

References

- 1 U.J. Griesser, and J. Dillenz (2002): Novel fully automatic moisture-sorption analyzer with a high sample throughput. Conference Workbook, 11. Weimarer Feuchgtetagung