Ana Valeria Ulhano Braga et al., J Food Process Technol 2014, 5:4
http://dx.doi.org/10.4172/2157-7110.S1.006

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Food Processing & Technology
July 21-23, 2014 Hampton Inn Tropicana, Las Vegas, USA

The new nanostructured water desorption sensor for measurements of water activity and food quality

Ana Valeria Ulhano Braga, Sergey Balashov, Olga Balachova, Maria Cecilia Queiroga Bazetto and Flavio Luis Schmidt
[1]Center for Information Technology Renato Archer, Brazil
[2]University of Campinas (UNICAMP), Brazil

Water activity (Aw) has great importance in the food industry because of its direct influence on the parameters of enzymatic, chemical and microbiological reactions. Currently, Aw is measured either by the dew point method or by the capacitance method. Both of them measure only the saturation value of Aw, i.e., the value which corresponds to the equilibrium between the ambient and the product. We developed the special fast (one measurement per second) surface acoustic wave Aw sensor with the film of graphene oxide as a sensitive element. It was calibrated in a wide range of Aw using the set of standard solutions of saturated salts. The sensor allows to measure kinetics of water molecules desorption from heterogeneous products in real time. The proposed algorithm for a kinetic curve analysis allows one to split the water desorption process into the set of simultaneous independent sub processes taking place in different components of the sample and to evaluate the water desorption velocity (WDV) and saturation values of Aw for each of them. Aw of the samples of fresh and powdered milk, fresh fruits, bread, margarine, concentrated juices, jams, seeds, chocolate and cookies were analyzed by the proposed algorithm and by the standard one adopted in the food industry. Resulting saturation values of Aw were the same with high accuracy for both algorithms. We also demonstrated the connection between the value of WDV and physical and chemical food characteristics. It was proven that the WDV value can provide additional information for food quality tests.

Biography

Ana Valeria Ulhano Braga graduated from the Biology Department of the Pontifical Catholic University of Campinas, Brazil in 2010. She had worked in the area of food microbiology for 2 years. In 2012, she joined the Center for Information Technology Renato Archer in Campinas. Currently, she is a Master's degree student at the Food Engineering Department of the University of Campinas (UNICAMP) and she works on the development of new types of water actsivity sensors for the food industry. Her research interests include the development of nano-fabricated bio-sensors and their application in the food industry.

anavaleriabraga@hotmail.com