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Thermodynamic properties of African arrowroot lily (*Tacca involucrata*) in relation to packaging

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Food processing is a tool that would provide safe, nutritious, adequate and affordable food for the teeming hungry malnourished people worldwide especially developing countries. In this study, blanching and fermentation were used to process an underutilized tuber, African arrowroot lily. The data obtained from moisture sorption studies were analyzed using the Clausius-Clapeyron and kinetic compensation equations. The net isosteric entropies (ΔS^o) of adsorption and desorption were lowest (-111.6 and 157.1 J/mol.deg. respectively) for the untreated sample and highest for the blanched and fermented samples (-63.9 and -73.4 J/mol.deg. respectively) within the monolayer moisture content region indicating stronger binding of moisture by the untreated samples and thermodynamic compensation between ΔH^{st} and ΔS^o in moisture sorption by the products. Further analysis of the data indicated an enthalpy-controlled (isokinetic temperature, Tc>harmonic mean temperature, T_{hm}) and spontaneous sorption process $\Delta G<0$. The storage life of the four products was significantly $P<0.05$ influenced by relative humidity (RH), water vapour permeability (B) of the packaging film and the pretreatments. The shelf life of the products in propafilm-C, Melinex-813, Dosek-49 and poly-30 in that order ranged from 24 months (50% RH) to 6.5 months (80%) with highest shelf lives for the blanched and fermented products and lowest for the untreated samples for a given packaging film and storage relative humidity at 32±2°C.

Biography

Bibiana Igbabul, an Associate Professor of Food Processing Technology is a PhD holder in Food Science and Technology from the University of Agriculture, Makurdi, Nigeria. She is the Deputy Director of Research and Development of the University. She is a member of the Editorial Board of *Current Research in Nutrition and Food Science*. She has published over 30 articles in peer reviewed journals. She is a member of Institute of Food Technology (IFT) USA, Nigeria Institute of Food Science and Technology (NIFST) and Nutrition Society of Nigeria. She is a co-author of a book in Food Science and Technology.

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