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Moisture sorption and isosteric heat of sorption properties of PVP-CMC hydrogel based food packaging material

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Development of biopolymers based eco-friendly packaging materials is encouraged worldwide. Nowadays, fruits and vegetables packaging materials are commonly prepared from petroleum based synthetic polymer, where bio-plastics are more concerned for maintaining freshness as well as from environmental protection point of view. Further, to enhance the shelf life of food stuff, moisture sorption and isosteric heat of sorption property of biobased packaging material are equally important as of mechanical property, breathability and biodegradability. Hence, to accomplish and maintain such properties within packaging material, carboxymethylcellulose (CMC) and polyvinylpyrrolidone (PVP) based hydrogel designated as "PVP-CMC hydrogel" has been prepared. The said hydrogel possessed other adventitious properties like porous internal morphology conferring breathability, proper flexibility required for machinability in preparation of pouches in different shape, size and thickness, etc. Water activity (a_w) is a measure of the energy status of the moisture content in a system and controls several properties of biopolymer based materials; high water activity leads to chemical and microbial instability. The equilibrium relationship between a_w (ranging within 0.0-1.0) and the corresponding moisture content at any particular temperature is represented by moisture sorption isotherm (MSI) which is most important in design of drying, packaging and storage systems of food. Representation of sorption data with best fit model followed by evaluation of isosteric heat of sorption is used as a tool for achieving these designs and will be discussed during presentation besides other interesting properties of PVP-CMC hydrogel.

Biography

Nabanita Saha has completed her PhD in 1991 in Microbial Biotechnology from Indian Institute of Technology, India. After completed her PhD, she worked at SPRERI as Scientific Officer. She joined at Tomas Bata University in Zlin in July 2001 and was appointed as an Associate Professor in 2006. She is author or co-author of 28 papers registered in WOS database, citations 146 (without self-citations), h-index 11. She has supervised 5 Doctoral Thesis; 2 completed 3 ongoing [as a supervisor (3) and consultant (2)]. She is a Board member of SPE, European Medical Plastic and member of several international scientific/professional societies.

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