Thermodynamic properties of water sorption of soy bran

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Brazil is one of the biggest soy bean producers and this crop is a commodity of extreme economic importance. Soy bran is a sub product of soy industry and it is rich in dietary fiber both soluble and insoluble. This product can help to reduce blood cholesterol and relieving constipation. Nowadays, soy bran is used as ingredient in different food industries. Calculation of the thermodynamic properties is of crucial importance, because provides an understanding to analysis of the properties of water and energy requirements associated with the sorption behaviour. The aim of this work is to determine the differential and integral thermodynamic functions in relation to moisture sorption of soy bran. Guggenheim-Anderson-de Boer (GAB) model was used in order to fit data sorption for sorption isotherms. The results showed that the differential enthalpy and entropy increased with decreasing equilibrium moisture content and the isokinetic temperature confirmed the linear chemical compensation between the enthalpy and entropy and the process was enthalpy driven. The spreading pressure increased with increasing water activity. The integral enthalpy decreased with increasing equilibrium moisture content, whereas the integral entropy increased, but negative values.