

**Title** Moisture sorption properties of chitosan  
**Author** Gabriela S. Rosa, Mariana A. Moraes and Luiz A.A. Pinto  
**Citation** LWT - Food Science and Technology, Volume 43, Issue 3, April 2010, Pages 415-420  
**Keywords** Differential entropy; Equilibrium isotherms; Heat of sorption; Pore size

### **Abstract**

The moisture equilibrium isotherms of chitosan were determined at 20, 30, 40, 50 and 60 °C, using the gravimetric static method. Experimental data were analyzed by the GAB, Oswin, Halsey and Smith equations. Isotheric heat and differential entropy of sorption were determined from the GAB model using the Clausius-Clapeyron and Gibbs-Helmholtz equations, and pore size distribution was calculated by the Kelvin and Halsey equations. The GAB and Oswin equations showed best fit to the experimental data with  $R^2 \approx 99\%$  and low mean relative deviation values ( $E\% < 10\%$ ). Monolayer moisture content values (from 0.12 to 0.20 kg kg<sup>-1</sup>) and water surface area values (from 450 to 700 m<sup>2</sup> g<sup>-1</sup>) decrease with increasing temperature. Isotheric heat and differential entropy of sorption were estimated as a function of moisture content. The Kelvin and Halsey equations were adequate for calculation of pore size distribution, which varied from 0.5 to 30 nm.