

## **Moisture adsorption isotherms of dried mangoes at a temperature range of 25 to 45°C**

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### **ABSTRACT**

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A study was conducted to determine the adsorption isotherms of dried mangoes at different temperatures. The results showed that the adsorption isotherms of dried mangoes at different temperatures were type III according to the BET classification. At a water activity <0.50, the equilibrium moisture content of samples at a given water activity increased as the temperature decreased. But at a water activity >0.50, the equilibrium moisture content of the samples increased as the temperature increased. The adsorption isotherms were fitted with 8 two-parameter equations (Bradley, Caurie, Halsey, Henderson, Kuhn, Linear, Oswin and Smith). The Caurie, Henderson and Oswin equations gave consistently high coefficients of determination when fitted to the adsorption isotherms of dried mangoes at different temperatures. However, further evaluation of the equations using the mean relative percentage deviations showed that the Caurie equation gave the best fit for describing the sorption data. A four-parameter modified Caurie equation was derived for predicting the equilibrium moisture content of dried mangoes as a function of water activity and temperature. Using the derived equation, the water activities of dried mangoes at different temperatures and constant moisture content were determined and used for obtaining the net heat sorption. The net heat sorption for dried mango decreased with increasing moisture content and can be expressed using linear equations for moisture ranges below 15% dry basis and above 15% dry basis.

**Keywords:** adsorption isotherms, dried mangoes, temperature, water activity, Caurie equation, net heat of sorption

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