

Dynamic adsorption of water vapour by palm kernel cake

Abstract

Dynamic water vapour adsorption isotherms by palm kernel cake in a packed bed column were determined at different relative humidity of air ($20\text{--}95 \pm 2\%$), superficial air velocity ($0.05\text{--}0.15$ m/s), constant ambient temperature ($30 \pm 1^\circ\text{C}$), and bed height, and with dried palm kernel cake of different particle sizes ($0.86\text{--}5.15$ mm). The isotherms were affected by the relative humidity, superficial velocity, and particle size, followed Brunauer-Emmett-Teller Type III classification, and fitted satisfactorily with the Freundlich equation. The maximum water adsorbed was less than 20%. This indicated that in the solid-state fermentation of palm kernel cake, where forced aeration was employed, the use of humidified air was inadequate in maintaining bed moisture level.