Abstract

In this study, sorption isosteric heat for some medicinal and aromatic plants was determined by the application of the Clausius–Clapeyron equation to sorption isotherms. Above the moisture contents of 0·14 d.b., the latent heat of vaporization of free water is not significantly different from the sorption isosteric heats for peppermint, marjoram, muscat, cardamom, chamomile and cloves, and above moisture contents of 0·10 d.b. for thyme and coriander. Sorption isosteric heats for peppermint, daphne, marjoram, muscat, cardamom, chamomile, cloves and coriander, thyme are higher for moisture contents below 0·12 and 0·10 d.b., respectively. Fennel and anise have the smallest sorption isosteric heat values among the selected medicinal and aromatic plants. There is no significant difference between the sorption isosteric heat of fennel and latent heat of vaporization of water. Among the selected medicinal and aromatic plants, cinnamon and ginger have the highest sorption isosteric heats for the moisture contents from 0·19 to 0·05 d.b. The ratios between the sorption isosteric heat and the latent heat of vaporization of free water Q^{st}/L_r for cinnamon and ginger are calculated as 1·29 and 1·27 at moisture content of 0·10 d.b., respectively. These are the highest ratios of those obtained for all the tested crops. The predicted sorption isosteric heat values are found to be considerably higher for cloves and lower for cinnamon than those of published sorption isosteric heat values for these crops. These differences ranged between 3·8 and 14·2%, depending on the plant species and moisture content.