

Influence of Synergism between κ -Carrageen and Locust Bean Gum on the Recrystallization of Ice in a Model System

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The influence of synergism between κ -carrageen and locust bean gum on recrystallization of ice in food-like system was determined by measurement of ice-crystal sizes in the frozen, and of the viscosity of the non-frozen matrix. During storage large crystals have been found to grow while small ones disappeared. The crystals of model matrices were of spherical shape already in the initial phase, except for those in the matrix containing κ -carrageen which were hexagonal. The studies have shown that hydrocolloids in a sucrose matrix do not prevent, but delay recrystallization of ice during the period of observation. The delay depends on the kind of hydrocolloid, mass fraction of both hydrocolloids and temperature. Recrystallization as a function of temperature is characterized by the Arrhenius approach. The flow behaviour of the hydrocolloid matrices has been shown to be non-Newtonian. Viscosity depended on the kind of hydrocolloid and on the temperature. A comparison of the results of viscosity studies to those of the recrystallization studies has shown that viscosity is most influenced by locust bean gum, while recrystallization is by κ -carrageen.