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Modeling of viscosity change during enzymatic clotting of milk

István Kertész, Kinga Varsányi, Klára Pásztor-Huszár, József Felföldi
Department of Physics and Control, Faculty of Food Science, Szent István University

Enzymic clotting of 13 milk samples with different fat contents (1.5%, 2.8%, 3.5%) were investigated. The change in the viscosity throughout curdling was measured with a rotational viscometer for 120 minutes, with a sampling interval of ten seconds. During the process, peaks were observed superimposed on a steadily increasing negative exponential curve, which are assumed to be caused by lump formation due to micelle aggregation. Therefore the analysis of the curve and of the behaviour of the peaks is expected to give a good approximation of the state of the curdling process. Therefore, as a first step, a reliable estimation procedure needs to be established for the base viscosity, before analysis of the distribution of the peaks. This study presents an algorithmic solution for this problem, finding a well-fitting estimation process for the viscosity curve (mean R^2 = 0.96).