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# Fractal scaling of Dairy gels: A rheology and neutron scattering study

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Milk and dairy products are common food systems. One of their important constituents is casein micelles (CM) (~10-100 nm) that form extended aggregates, and further develop into a network by the process of gelation. A key structural parameter is the fractal dimension (Df) of this network[1-3]. Scattering and rheology have been explored in the past to access the relevant length scales and Df of such systems[1-6]. In the present work, dairy gels are formed using two different mechanisms: acidification, and enzymic (rennet)-induction [3,6]. The effect of mineral equilibria on enzymatic coagulation of skim milk is also explored[7]. Both the gels are investigated using oscillatory rheology, and ultra-small-angle neutron scattering (USANS) at different concentrations. Contrast variation, through the variation of H2O/D2O ratios, facilitates selective visualization of fat and protein components, and importantly the CM network during network formation. The perspectives on Df from both the techniques are compared to understand the inherent structural hierarchy.
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