

Dissociation of Hydrophobic Interactions in Whey Protein Polymers: Molecular Characterization Using Dilute Solution Viscometry

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Abstract : Whey represents about 85-95% of the milk volume and about 55% of milk nutrients. Whey proteins are of special importance in formulated foods due to their rich nutritional and functional benefits. Whey proteins form large polymers upon heating to a temperature greater than the denaturation temperature. Hydrophobic interactions play an important role in building whey protein polymers. In this study, dissociation of hydrophobic interactions of whey protein polymers was done by adding Sodium Dodecyl Sulphonate (SDS). At low SDS concentrations, protein polymers were dissociated to smaller chains, as revealed by dilution solution viscometry (DSV). Interestingly, at higher SDS concentrations, polymer molecules got larger in size. Intrinsic viscosity was increased to many folds when raising the SDS concentration from 0.5% to 2%. Complex molecular arrangement leads to the formation of larger macromolecules, due to micelle formation. The study opens a venue for manipulating and enhancing whey protein functional properties by manipulating the hydrophobic interactions.

Keywords : whey proteins, hydrophobic interactions, SDS

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