**Viscoelastic properties of Protein-Stabilized Emulsions and applications in various directions**

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**Abstract**

Protein-stabilized emulsions have unique structural and functional properties and thus have a significant attention in various industries. The viscoelastic behavior of these emulsions plays a crucial role in determining their stability, rheology, and applicability in diverse applications such as food, pharmaceuticals, and cosmetics. The basic principles of emulsion stabilization using different types of proteins and their adsorption mechanisms at the oil-water interface are very interesting such as casein protein stabilized emulsions and whey protein stabilized emulsions. The several factors influencing the viscoelastic properties of these emulsions such as the concentration and type of protein, emulsification methods, pH, ionic strength, and temperature. The interplay between these factors and their effect on the mechanics of emulsions is of great interest to the researcher. Special attention is given to the implications for the design of emulsion-based food products, drug delivery systems, and personal care formulations. The applications of protein-stabilized emulsions are also important, emphasizing the connection between their viscoelastic properties and functionality in real-world products.

In conclusion, this chapter integrates the current understanding of the viscoelasticity of protein-stabilized emulsions, highlights the key factors influencing their rheological behavior, and sheds light on their applications in various industries. It not only serves as a valuable reference for researchers and practitioners in the field but also identifies critical knowledge gaps that require further investigation to advance the field of protein-stabilized emulsions. Finally, this chapter aims to provide a comprehensive analysis of the current state of knowledge on the viscoelasticity of protein-stabilized emulsions.