

PROTEIN AGGREGATES AS BUILDING BLOCKS FOR OIL STRUCTURING

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Over the recent years, structuring of organic solvents and oils into organogels (oleogels) has gained much attention from colloid, material and food scientists. Although many gelators are known, their use in applications is limited as they are often expensive, not effective, and have low stability. In this presentation, we will present a new category to the common oleogelators: proteins. As they are cheap, widely available, biocompatible and food grade, they have a large potential to be used in many different types of applications.

We have created heat-set protein building blocks of different dimensions (from nanometer to millimeter) that are used to create protein networks in oil. We have developed a method to transform the protein building blocks into the oil and change the interactions between the building blocks to control the network formation and the final properties of the protein oleogels. This presentation will give an overview of the different interactions between proteins that are of relevance in hydrophobic environments, and discuss how these interactions can be varied. To vary the interactions, different oils were used, water was added, and a heat treatment was applied. The oleogels show large versatility regarding rheological properties (strength, yield stress and plastic behavior), in a similar way as is known for very common protein hydrogels. Very firm protein oleogels can be formed that show fracture properties. But also protein oleogels with a spreadable behavior.