

Research plan

B. Food Physics and Food Processing

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Rheology of emulsion gel. Physicochemical properties of emulsion.

1: Emulsification by Low Energy Method (Gohtani)

Emulsification can be classified into physical and chemical method. The latter method is low energy method.

In physical method, emulsions are prepared by dispersing one phase in another immiscible phase under strong mechanical power, using high-shear stirring, high-pressure homogenizers and ultrasound generators. On the other hand, in emulsification by chemical methods (e.g., liquid-crystal emulsification, surfactant phase emulsification, and phase inversion emulsification), emulsion can be prepared without such a strong mechanical power owing to the physico-chemical properties of the various types of molecular aggregates formed in oil-surfactant-water system.

We are investigating the low energy emulsification in food system, using food grade surfactants and edible oils.

2: Evaluation of Rheological Properties of Food System (Ikeda and Gohtani)

Rheological properties are important for food system because the rheological properties influence the taste of food strongly and the food processing. We are investigating the rheological properties (e.g., viscosity, static viscoelasticity and dynamic viscoelasticity) for emulsion, emulsion gel and the mixture gel for protein and polysaccharide in food system.