

エマルションの基礎から分散安定化、乳化剤フリー エマルションの可能性まで（その2）

Basics of Emulsions, Colloidal Stabilization and Potential of Emulsifier-Free Emulsions: Part 2

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Abstract

This review describes the feasibility of emulsifier-free emulsification (EfE) on the basis of demulsification mechanism of emulsion which is a transient mixture of oil and water. The demulsification of emulsifier-free (Ef-) emulsions is prevented by adjusting the interfacial tension between oil and water, the density difference between oil and water, the size of droplets (dispersed phase), the viscosity of continuous phase, the repulsive interaction among droplets, and the solubility of droplets (dispersed phase) to continuous phase. For example, Ef-oil-in-water (O/W) emulsions, in which vegetable oil is dispersed in water, are colloidally stable compared to the Ef-O/W emulsions, in which hydrocarbon oil is dispersed in water, because the values of interfacial tension and density difference between vegetable oil and water, and solubility of vegetable oil to water are much smaller than those of interfacial tension and density difference between hydrocarbon oil and water, and solubility of hydrocarbon oil to water. Also, the flocculation and coalescence of oil droplets caused by collision of oil droplets are prevented because of the negative surface charge of oil droplets in Ef-O/W emulsions. Furthermore, Ef-water-in-oil (W/O) emulsions, in which water is dispersed in vegetable oil, are colloidally stable compared to the Ef-W/O emulsions, in which water is dispersed in hydrocarbon oil, because the viscosity of vegetable oil is much higher than that of hydrocarbon oil. So, it is important to focus on the physical properties of oil for formulation of emulsions.

キーワード：エマルション、解乳化、油の物性、乳化剤フリー乳化

Keywords : Emulsion, Demulsification, Physical properties of oil, Emulsifier-free emulsification

1. はじめに

油と水が過渡的に混合したエマルションは、

食品、医薬品、化粧品、農薬など、多岐にわたり活用されている。一方で、エマルションは油と水が過渡的に混合した液滴分散系であるため、熱力学的に不安定である。つまり、エマルション（液滴分散系）の状態を維持することが難しい。そのため、エマルション（液滴分散系）を長期分散安定化することは人類の挑戦であり、現在において挑戦し続けている。

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