

# Emulsification by Amino Acid-Type Active Interfacial Modifier

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This report focuses on the preparation and stabilization mechanism of oil-in-water (O/W) type emulsions in the presence of amphiphilic 1:1 stoichiometric complexes of acylglutamic acids ( $C_n\text{Glu}$ ) with tertiary alkylamines ( $C_n\text{DMA}$ ). Relatively stable emulsions were obtained when C16Glu-C16DMA (or C18Glu-C18DMA), hexadecane, and water were homogenized at 80°C and then stored at room temperature. The gel-liquid crystal phase transition temperature ( $T_c$ ) of C16Glu-C16DMA and C18Glu-C18DMA dispersed in water was determined to be ca. 39 and 53°C, respectively. This indicates that the complexes form an adsorbed layer at the oil/water interface during the homogenization process above the  $T_c$ , and then change into a gel during storage at room temperature. The gel phase formed at the oil/water interface prevents the oil droplets from coalescing. In contrast, shorter chain analogues (C10Glu-C10DMA and C12Glu-C12DMA) did not yield stable emulsions since their adsorption layers were not able to prevent coalescence of the oil droplets (i.e., the  $T_c$  of these analogues was below the room temperature). The dispersion stability of these emulsion systems can also be controlled by changing the aqueous pH.