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Internal Dynamics of Double Emulsion Creams and Polymer-Dispersed Complex Droplets HU GANG, Hong Kong Baptist University — The availability of monodisperse double emulsions allows for detailed study of their stability and rheological properties. Practical use of double emulsions concerns the structure and structural evolution of the complex droplets. The usually achievable size of the complex droplets ranges from a micrometer to tens of micrometers. To obtain a homogeneous system, a double emulsion has to be in the form of cream or gel to avoid macroscopic phase separation. However, immobilizing the double emulsion drops does not cease the full dynamics since the internal smaller droplets are also subject to thermal agitation. The ability to track the evolution of the internal encapsulated phase is essential to the understanding of the kinetic stability of a new formulation. Conventional light scattering encounters significant difficulties to probe the structure of concentrated emulsions while diffusing-wave spectroscopy (DWS) shows a unique advantage. We prepare monodisperse W/O/W double emulsions and apply DWS to study the structure of double emulsion creams and gels. We also test the sensitivity of DWS when the amount of encapsulated phase is varied by induced coalescence or osmotic gradient.

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