

Formation of controllable complex emulsions by phase separation in a microfluidic system

최창형, David A. Weitz¹, 이창수*
충남대학교; ¹Harvard Univeristy
(rhadum@cnu.ac.kr*)

Emulsions with complex architectures, including, Janus emulsions, multiple emulsions, or multilayered emulsions, have attracted great interest because of their significant potential in many applications, including cosmetics, foods, pharmaceuticals, materials, and chemical separations. The preparation of emulsion with precise control over both size and structure remains one of the most challenging issues from a colloid perspective because the emulsions with complex geometries are of considerable importance. We present one-step method for generating complex emulsions that involve the phase separation of the single droplet generated in the microchannel. This approach allow for generation of double, triple, quadruple, and Janus emulsions with narrow size distribution. These emulsions can be used as used as ideal templates for the synthesis of new functional particles, such as hollow microcapsules, hemispheres, Janus particles. Furthermore, this technique enables simultaneous encapsulation of hydrophilic and hydrophobic compounds in a one-step process.