

## Preparation of spherical colloidal crystals using W/O emulsions

이수연, 김신현, 양승만\*  
한국과학기술원  
(smyang@kaist.ac.kr\*)

Over the past few years, numerous approaches have been proposed to fabricate three dimensional colloidal crystals, which possess full 3-D photonic band gap. In this study, micrometer-sized spherical colloidal assemblies with narrow size distribution were prepared. First, monodisperse W/O emulsions were generated by using a droplet break-off technique. Then, controlled microwave heating of water inside the droplets created self-organized spherical colloidal crystals. Actually, the consolidation of colloidal particles in emulsion droplets by convection takes a few days. However, the microwave-assisted method can reduce complete evaporation time to consolidate the colloidal particles in emulsion to tens of minutes. The evaporation rate of water and the consolidation time can be also controlled easily by controlling the microwave intensity. The results showed that the packing quality of colloidal crystals depends on the intensity of microwave irradiation for removing water.