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One-pot fabrication of graphene oxide-patched hollow-structured microgel particles in a microcapillary device ARAM BYUN, EUN SEON JEONG, JIN WOONG KIM, Hanyang Univ — Microgels are colloidal gel particles that consist of chemically cross-linked three-dimensional polymer networks. They play an essential role in delivery and release of active ingredients in medicine, cosmetics, food, and even autonomic self-healing applications. Despite their wide applicability, permeability control through the hydrogel phase is limited due to its intrinsic loose network nature. Herein, we introduce generation of hollow-structured microgel particles whose interfaces were patched with graphene oxide (GO) sheets. The whole fabrication procedure was carried out in a microcapillary device in a single step. GO sheets have an ability to adhere to both O/W and W/O interfaces. Taking advantages of this behavior, we generated monodisperse O/W/O double emulsion whose interfaces were patched with GO sheets. Solidification of the aqueous middle phase to the hydrogel phase gave rise to uniform GO-patched microgel shell particles. Furthermore, we demonstrated that the permeation of molecules through the shell could be controlled even to small molecular length scales due to the adsorption of GO.

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