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**Fabrication of Uniform Hydrogel Microparticles with Alternate Polyelectrolyte/Silica Shell Layers for Applications of Controlled Loading and Releasing** EUN SOOK JEONG, JIN WOONG KIM, Hanyang Univ — Hydrogel particles, also known as microgels, consist of cross-linked three-dimensional water-soluble polymer networks. They play an essential role in loading and delivering active ingredients in medicine, cosmetics, and foods. Despite their excellent biocompatibility as well as structural diversity, much wider applications are limited due mainly to their intrinsically loose network nature. This study introduces a practical and straightforward method that enables fabrication of hydrogel microparticles layered with a mechanically robust hybrid thin shell. Basically highly monodisperse hydrogel microparticles were produced in microcapillary devices. Then, their surface was coated with alternate polyelectrolyte layers through the layer-by-layer deposition. Finally a thin silica layer was again formed by reduction of silicate on the amino-functionalized polyelectrolyte layer. We have figured out that these hybrid hydrogel microparticles showed controlled loading and releasing behaviors for water-soluble probe molecules. Moreover, we have demonstrated that they can be applied for immobilization of biomacromolecules, such as bacteria and living cells, and even for targeted releasing.

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