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**Reversible, All-Aqueous Assembly of Hydrogen-Bonded Polymersomes**[1] YUHAO WANG, SVETLANA SUKHISHVILI, Department of Chemistry, Chemical Biology and Biomedical Engineering, Stevens Institute of Technology, Hoboken, New Jersey 07030 — We report on sub-micron-sized polymersomes formed through single-step, all-aqueous assembly of hydrogen-bonded amphiphilic polymers. The hollow morphology of these assemblies was revealed by transmission electron microscopy (TEM), cryogenic scanning electron microscopy (cryo-SEM) and confocal laser scanning microscopy (CLSM). Stable in acidic media, these polymersomes could be dissolved by exposure to basic pH values. Importantly, the diameter of assembled hollow structures could be controlled in a wide range from 30 nm to 1 $\mu$m by the molecular weight of hydrogen-bonding polymers. We will discuss key quantitative aspects of these assemblies, including kinetics of hollow structure formation, time evolution of polymersome size, and the role of polymer molecular weight on membrane thickness and bending rigidity. We believe that our approach demonstrates an efficient and versatile way to rationally design nanocontainers for drug delivery, catalysis and personal care applications.

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