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Thermoresponsive microcapsules for controlled release of hydrophilic cargo ESTHER AMSTAD, DAVID WEITZ, Harvard University — Thermoresponsive microcapsules that collapse upon increasing the temperature above their lower critical solution temperature (LCST) such as poly(N-isopropyl acrylamide) (PNIPAM) capsules are well known. However, capsules consisting of thermoresponsive polymers that possess an upper critical solution temperature (UCST) and therefore swell upon increasing the temperature above their UCST are scarce. We will present a microfluidic method to assemble thermoresponsive poly([2-(methacryloyloxy)-ethyl]-dimethyl-[3-sulfopropyl-ammoniumhzdroxide) (PMEDSH) microcapsules that have UCST. These capsules are in a collapsed state at room temperature and become highly water permeable upon increasing the temperature above the UCST. To simultaneously allow for encapsulation of hydrophilic cargo and enable the water based polymerization reaction of the PMEDSH shell, these microcapsules are assembled as water/water/oil emulsions using capillary microfluidic devices. The resulting PMEDSH microcapsules are envisaged as delivery vehicles and microreactors that allow for temperature induced controlled release of hydrophilic cargo. .

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