

Abstract Submitted
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Selective, Controllable, and Reversible Aggregation of Polystyrene Latex Microspheres via DNA Hybridization PHILLIP ROGERS, CARL BAUER, STEPHEN VANDERET, DANIEL HANSEN, ANTOINE CALVEZ, JACKSON CREWS, Cal Poly Physics Dept., JAMES LAU, Cal Poly Materials Dept., ALISTAIR WOOD, KHODADAD DINYARI, Cal Poly Physics Dept., BRAD ROBERTS, Cal Poly Materials Dept., ERIC MICHEL, UCSB Chemical Engineering Dept., DAVID PINE, UCSB Chemical Engineering and Materials Departments, PETER SCHWARTZ, Cal Poly Physics Dept., PHYSICS DEPT., CAL POLY STATE UNIV., SAN LUIS OBISPO TEAM, MATERIALS ENGINEERING DEPT., CAL POLY STATE UNIV., SAN LUIS OBISPO TEAM, CHEMICAL ENGINEERING DEPT., UC-SANTA BARBARA TEAM, MATERIALS DEPARTMENT, UC-SANTA BARBARA TEAM — The directed three dimensional self-assembly of microstructures and nanostructures through the selective hybridization of DNA is the focus of great interest toward the fabrication of new materials. Single stranded DNA is covalently attached to polystyrene latex microspheres and functions as a “smart Velcro” by only bonding to another strand of DNA of complementary sequence. The attached DNA increases the charge stabilization of the microspheres and allows controllable aggregation of microspheres by hybridization of complementary DNA sequences. The process is reversible by heating, with a characteristic “aggregate dissociation temperature” that is dependent on salt concentration, and the evolution of aggregate dissociation with temperature is observed with optical microscopy.

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