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Responsive Block Copolymer and Gold Nanoparticle Hybrid Nanotubes. SEHOON CHANG, SRIKANTH SINGAMANENI, SETH YOUNG, VLADIMIR TSUKRUK, Georgia Institute of Technology — We demonstrate the facile fabrication of responsive polymer and metal nanoparticle composite nanotube structures. The nanotubes are comprised of responsive block copolymer, polystyrene-block-poly (2-vinylpyridine) (PS-b-P2VP), and gold nanoparticles. PS-b-P2VP nanotubes were fabricated using porous alumina template and *in situ* reduction of the gold nanoparticles in P2VP domains. Owing to the pH sensitive nature of P2VP (anionic polymer with a pK_a of 3.8), the nanotubes exhibit a dramatic change in topology in response to the changes in the external pH. Furthermore, the gold nanoparticles in the responsive block exhibit a reversible aggregation, causing a reversible change in optical properties such as absorption.

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