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Self-assembly of alternating copolymer vesicles for the highly selective, sensitive and visual detection and quantification of aqueous Hg^{2+}

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Abstract

In recent years, there has been an ever-increasing demand to develop highly sensitive and selective colorimetric detection systems to tackle the growing threat of potentially toxic mercuric ions (Hg^{2+}) exposure at the global level. However, most of the reported chemosensors for Hg^{2+} detection worked only in organic or in mixed solutions (organic/aqueous). The properties of the reported aqueous chemosensors for Hg^{2+} are not satisfactory. Herein, we take the advantage and present the first vesicular chemical sensor for the aqueous detection of Hg^{2+} with a high efficiency and selectivity. The vesicles were obtained through the aqueous self-assembly of the newly synthesized amphiphilic alternating copolymer poly(2, 3-dihydroxybutylene-alt-2,3-dihydroxybutylenedithioether) [P(DHB-a-DHBDT)] grafted with 2-(5-bromopyridine-2-yl)-3',6'-