

Abstract Submitted
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Visible and NIR Polyelectrochromism in Polymer Acid Doped Polyaniline JACOB TARVER, YUEH-LIN LOO, Department of Chemical Engineering — Switching between the intermediate and fully reduced states of polyaniline (PANI) results in chromic transitions between green and transparent, respectively, while complete oxidation results in an additional transition to violet. Until now, efforts to exploit PANI's polyelectrochromicity have been hindered by conflicting requirements for stable switching. The green-transparent transition requires acidic conditions due to the proton dependence of PANI's intermediate form. PANI, however, undergoes hydrolysis when completely oxidized at these conditions; its violet form has therefore been elusive. By template polymerizing aniline on poly(2-acrylamido-2-methyl-1-propanesulfonic acid), PAAMPSA, we demonstrate sustained PANI electroactivity beyond pH 9. No longer limited by the requirement for acidic conditions, we show, for the first time, stable and reversible switching between the three oxidation states of PANI in aqueous media. Further, PANI-PAAMPSA exhibits large NIR contrast between its intermediate and fully reduced states, opening the door for PANI-based electrochromic devices operating in the NIR as well as visible range.

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