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**An Investigation of Polyelectrochromism in Water-Dispersible Polyaniline** JACOB TARVER, JOUNG EUN YOO, YUEH-LIN LOO, Department of Chemical Engineering, Princeton University — The promise of polyaniline (PANI)-based devices, such as electrochromic windows or billboards, is motivated by the coupled nature of PANI's redox and chromic properties. In its fully reduced and oxidized form, PANI is electrically insulating and characteristically transmits yellow and violet, respectively. Protonation of PANI's intermediate oxidation state induces electrical conductivity and shifts its transmission to green. This proton dependence has historically limited the use of small molecule acid doped PANI to acidic media. Template synthesis of PANI on poly(2-acrylamido-2-methyl-1-propanesulfonic acid), or PAAMPSA, yields electrostatically stabilized PANI-PAAMPSA particles; films comprising these particles maintain electroactivity in solutions as high as pH 10. Exposure to dichloroacetic acid moderates the electrostatic interactions, thereby relaxing the material's globular structure. This structural rearrangement significantly improves the stability and reversibility of repeated cycling between PANI's redox states. Relaxation of PANI-PAAMPSA's structure thus affords enhanced robustness to this readily-processible system.

Jacob Tarver
Department of Chemical Engineering, Princeton University

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