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Oxidatively stable polyaniline derivatives for electrodes in energy storage[1] JODIE LUTKENHAUS, JU-WON JEON, Texas A&M University, LUTKENHAUS LABORATORY TEAM — Conjugated polymers have been explored as electrodes in batteries and pseudocapacitors for over 30 years. Yet, their widespread implementation has been hindered for several reasons such as oxidative stability, low capacity, and rate limitations associated with ionic mobility relative to current state-of-the-art. On the other hand, conjugated polymers have much to offer because of their good electronic conductivity, high Coulombic efficiency, and theoretical capacities comparable to those of metal oxides. Our lab's current goal is to overcome the aforementioned challenges, so that conjugated polymeric electrodes can be suitable used in energy storage for applications such as mechanically flexible energy storage and structural power system. This talk will present one of several experimental approaches towards synthesis and processing of polyaniline that achieve oxidatively stable, high capacity, ionically mobile electrodes. This derivative is a water-processable colloid of intimately mingled polyaniline and polyacid, where the polyacid acts as the dopant. The origin of the oxidative stability is investigated using computation modeling.

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