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(54) Title: SELF-DOPED POLYANILINE NANOPARTICLE DISPERSIONS BASED ON BORONIC ACID-PHOSPHATE COMPLEXATION

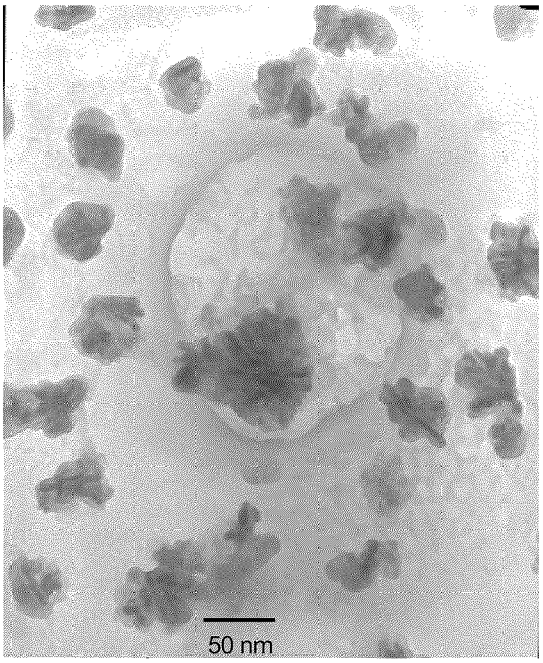

Fig. 2

(57) Abstract: Poly(anilineboronic acid)/phosphate nanoparticle dispersions are produced in high yields using the reactivity of the boronic acid moiety with phosphate in the presence of fluoride. The poly(anilineboronic acid)/phosphate dispersions have been characterized using spectroscopic, microscopic and electrochemical techniques. According to ^{11}B NMR studies, the formation of anionic tetrahedral boronate group in phosphoric acid in the presence of fluoride forms the basis of self-doped, stabilized PABA nanoparticle dispersion. Transmission electron microscope images show that 25-50 nm diameter PABA nanoparticles are formed under these conditions. UV-vis, FT-IR-ATR spectroscopic and cyclic voltammetric results confirm the formation of the conducting form of PABA. Films produced from these particles exhibit enhanced redox stability and potential dependant conductivity under neutral and basic pH conditions due to the formation of a boron- phosphate complex containing fluoride, which results in a self-doped form of the polymer.

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