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[SEM-262] Optical and electrical characterization of HCl doping polyaniline

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The most of semiconductors are crystaline inorganic solids, however, it has been demostrated that conjugated organics molecules can exhibit semiconductor behavior. The conducting polymers have specific properties such as high flexibility, high impact resistance and unique electronic-optical properties. As a consequence has a potential application in a variety of advanced devices ranging from organic electronics, sensors, batteries, actuators, thermoelectrics, to electro-optic and electro-chromatic devices. In this study, it is reported the synthesis and characterization of a series of HCl (0.5 M, 0.75 M and 1.0 M) doping polyaniline (PANI) by oxidative polymerization using ammonium persulfate (APS) as oxidant, and maintaining the reaction temperature in the range from 0° to 3° C. The asprepared samples were characterized using X-ray diffraction, IR and UV-vis spectroscopy in irder to know their structural and optical properties. The electrical characteristics were analyzed by Hall effect. XRD analysis indicates that all PANI samples exhibit typical crystalline peak at 25°, whereas the UV-vis spectra show the band absorption in the range from 240 to 320 nm asosiated to the HOMO-LUMO transition. Finally, the conductivity of PANI samples were about 6.2, 9.7 and 26.4 S/cm.