

Morphological analysis of Polyaniline (PANI) integrated cotton fabric

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ABSTRACT

With the exponential growth of flexible electronics, conductive polymer Polyaniline has been acting as a protagonist since its discovery. Polyaniline is endowed with optical and electrical conductivity, a low-cost synthesis process, and environmental stability. However, the irregular, rigid form and specific choice of solvents often hinder its widespread application. The conductive fabric can be used in the field of flexible energy harvesting, sensing, electromagnetic shielding or many more functional applications. In this study, conductive cotton fabric was fabricated using a facile in-situ chemical oxidative polymerization of Aniline on a Cotton fabric surface. Doping was performed using HCl, maintaining three different concentrations levels (1M, 2M and 3M). The color of Polyaniline turned from Blue (Emeraldine Base) to Emerald Green (Emeraldine Salt) upon its successful formation. Visual analysis, Scanning Electron Microscopy, Fourier-Transform Infrared Spectroscopy, and Energy Dispersive X-Ray Analysis were performed to justify the homogeneity and bonding adhesion with the fabric surface. It is observed that, the deposition of Polyaniline is much uniform and homogenous with the increase of dopant concentration.

KEYWORDS

Polyaniline, Cotton, in-situ Polymerization; SEM, EDX

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