

Effect of dodecylbenzene sulfonic acid dopant concentrations on the synthesis of polyaniline

ABSTRACT

Modified physicochemical properties of polyaniline (PANI) colloids in response to various polymerization conditions are being made to enhance the electrical conductivity of PANI that can be used in supercapacitor purpose. In this paper, an attempt has been made to improve the mechanical stability of PANI by synthesizing with different concentrations (0.8, 1.65, 2.0, and 2.5 mmol) of dodecylbenzenesulfonic acid (DBSA). The DBSA doped PANI colloids were characterized by using XRD, Raman spectra and SEM. PANI containing 2.0 mmol of DBSA has the highest percentage of crystallinity (X_c %) as analyzed from XRD spectrum. Scanning electron microscopy (SEM) has been used to investigate the influence of the feed concentration of DBSA on the morphology of the polymer. A detailed study on the Raman spectroscopies of PANI-DBSA colloids has been carried out which shows that intensity of RAMAN spectra are directly proportional to the increased crystallized region of doped PANI samples; higher intensity may attribute due to the large change in polarization associated with the formation of covalent bond in PANI.

Keyword: Polyaniline; Raman; Advance material; Dodecylbenzene; Sulfonic acid