

Electrochemical deposition of polycarbazole thin films onto tin oxide coated glass Physicochemical and optoelectronic characterizations

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Abstract

Polycarbazole (PCz) thin films have been synthesized by electrochemistry. The influence of the deposition technique, potentiostatic or potentiodynamic, on the properties of the PCz films has been studied using the deposition time and the potential maximum as parameters. The PCz films have been characterized by thermal analysis, X-ray photoelectron spectroscopy (XPS), near ultra violet, visible and infra red absorption, photoluminescence (PL) measurements, scanning electron microscopy and microprobe analysis. Whatever the technique used, polymerized carbazole (Cz) films are deposited onto tin oxide coated glass. It is shown that potential maximum of 1400 mV or more induces some Cz nucleus destruction with N■N bonds formation. It is also shown by different techniques such as XPS, visible and IR absorption, microanalysis, PL, that the oxido–reduction reaction is reversible. Moreover, after dedoping treatment, nearly pure PCz film can be obtained, which allows obtaining PCz depoped films with good PL properties..