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Surface modification of fibers by conducting polymers and their use in composites¹ HANDE YAVUZ, GREGORY GIRARD, JINBO BAI, Lab. MSS/MAT, CNRS UMR 8579, Ecole Centrale Paris, 92295 Châtenay Malabry Cedex, LAB. PPSM, CNRS UMR 8531, ENS CACHAN, 94235, CACHAN CEDEX COLLABORATION, ACXYS TECHNOLOGIES FRANCE COLLABORATION —

Due to the discovery of their incredible functional properties, carbon nanotubes (CNTs) have drawn a great deal of interest from both academic and industrial research teams in the past few years. Since novel materials are to be integrated in structural and functional applications in several fields, inclusion of CNTs as a reinforcement component in polymer matrix composites (PMC) could bring new solutions. However, in order to obtain more advanced CNTs composites, the amount of strong bonding between CNTs and matrix must be realized to ensure the effective stress transfer in a PMC. This research aims to establish an efficient dielectric barrier discharge technique for the surface modification of CNTs grafted carbon fibers (CNTs-CF) with plasma polypyrrole (PPPy) in order to be used in PMC. It is found that response surface methodology can be applicable in modeling to evaluate the effects of important process variables on electrical resistivity of CNTs-CF. From low to high plasma powers, X-ray Photoelectron Spectroscopy studies revealed the loss of α - and β -carbons in pyrrole ring. The higher the plasma power the lower the electrical conductivity and the higher the mechanical properties.

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