

# Electrochemical Synthesis of the Composites Based on Multi-Wall Carbon Nanotubes and Polypyrrole Doped with Phosphomolybdic Acid Heteropolyanions and Their Vibrational Properties

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Using cyclic voltammetry, Raman scattering and infrared (IR) spectroscopy, new findings concerning the electrochemical synthesis of composites based on multi-wall carbon nanotubes (MWNTs) and polypyrrole (PPY) doped with  $\text{H}_3\text{PMo}_{12}\text{O}_{40}$  heteropolyanions are described in this report. To better understand the electrochemical mechanism behind the synthesis of these composites, the influence of the concentrations of pyrrole and the electrolytes of  $\text{H}_3\text{PMo}_{12}\text{O}_{40}$  and  $\text{H}_2\text{SO}_4$  on the cyclic voltammogram profile is studied. The formation of PPY doped with  $\text{H}_3\text{PMo}_{12}\text{O}_{40}$  heteropolyanions onto the MWNT surface is demonstrated by complementary studies of Raman scattering and IR spectroscopy.

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**Keywords:** carbon nanotubes, polypyrrole, cyclic voltammetry

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