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Preparation of humidity sensor based on conductive composite (PS-PPY/MMTO)

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This work presents the synthesis and characterization of electrospun polystyrene (PS) membranes and its coating with polypyrrole (PPy) and organophilic montmorillonite (MMTO). Afterwards, the PS/PPy/MMTO composite membrane were evaluated as a humidity sensor. The materials' characterization was carried out using the techniques of X-ray diffraction (XRD), Fourier-Transform infrared (FTIR), ultraviolet-visible absorption spectroscopy (UV-vis), contact angle, and scanning electron microscopy (SEM). Through these techniques it was confirmed the organophilization process of montmorillonite and its presence along PPy on the composite membrane. In regards to the use of PS/PPy/MMTO as a humidity sensor, it was carried through the analysis of the changes on the materials' electrical resistance obtained by two-probe measurements. Therefore, the preliminary study showed that its sensing properties increases with the addition of MMTO. The composite sensitivity increases from 105% to 497% after the incorporation of the clay.