

Vanadium oxide/poly (3,4- ethylenedioxythiophene)(V2O5-PEDOT) hybrid materials were prepared in a rotating quartz plasma reactor via capacitively coupled radio frequency (RF 13.56 MHz) plasma. Thin films of V2O5-PEDOT hybrid and V2O5 were obtained by electron beam evaporation technique onto flexible PET substrate for electrochromic devices (ECDs) applications. As a counter electrode, both RF magnetron sputtered MoO3 onto ITO coated PET and only ITO coated PET electrodes were used. Characterizations of the films were carried out via using scanning electron microscopy-energy dispersive X-ray spectroscopy (SEM-EDX) and X-ray diffraction (XRD). Hybrid ECDs results showed that synergistic effect depending on improved stability between V2O5 and PEDOT. As a result, we developed all solid complementary electrochromic devices including V2O5, V2O5-PEDOT and MoO3 films. The electrochromic device characteristics such as electrochromic contrast, coloration efficiency, switching time were calculated from optical and electrochemical measurements. The highest coloration efficiency and optical contrast were obtained as 53 cm<sup>2</sup>/C and 17% for V2O5-PEDOT/MoO3-based ECD.