

Tungsten oxide (WO₃) thin films were deposited onto flexible substrates using radio frequency magnetron sputtering for high electrochromic performance purposes. The effects of both non-aqueous electrolytes (lithium perchlorate (LiClO₄), lithium trifluoromethanesulfonate (LiTRIF)) and the electrochromic thickness layers on the electrochromic properties of flexible tungsten oxide films were investigated. The deposited film characteristics were measured using cyclic voltammetry, scanning electron microscopy and X-ray diffraction. The electrochromic device characteristics such as electrochromic contrast, coloration efficiency, and switching time were determined as a function of the WO₃ film thicknesses. Fast switching times (bleaching time (t_b): 5.88 s; coloration time (t_c): 1.6 s) were obtained for the electrochromic device with a 465-nm WO₃ film. Reversibility and switching time properties of WO₃ film (465 nm) were compared to LiClO₄ and LiTRIF liquid electrolyte media. Higher reversibility of 82% and better current density of 3 mA/cm² were obtained for a WO₃ film-containing device in LiTRIF electrolyte solution.