

Research Title : A Fabrication of Electrochromic intelligent material
Name of Researcher : Sanya Khunkhao
Name of Institution : Fact. Of Electrical Engineering Dept. of Electrical
Sripatum University
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ABSTRACT

This research as describe an electrochromic device were fabricated by evaporated deposit in thin films of transition metal oxides by a tungsten oxide (WO_3) film on transparent metal covered glass substrates. The Indium Tin Oxide Glass: ITO was used as counter electrodes to form electrochromic device. The two glass substrates with their associated transparent conductors form a cavity which is filled with an electrolyte solution. A typical EC device consists of a thin film of EC material (WO_3) an ion storage layer (IS), and an ion conducting layer (IC) sandwiched between two transparent conducting oxide (ITO) layers. The electrical properties of WO_3 are the preferred material for EC devices by a small dc voltage (1-3 volts) across the device, the color and bleach properties can be changed level in one mode of polarity when an electric current flows through the device. It will remain in that state for a prolonged period of time, up to many hours, without any applied voltage. On reversing the polarity, the device will return to its original transparent state. Such electrochromic films are manner into anodic (coloring upon electrochemical oxidation) and cathodic (coloring upon electrochemical reduction) coloring films. The reactions resulting in the coloration mechanism, it is generally accepted that it is due to simultaneous injection and extraction of electrons and light metal ions (H^+ , K^+ ...) into the oxide layer according to the reaction scheme: WO_3 (colorless) + xM^+ + $xe^- \leftrightarrow M_xWO_3$ (blue). To support dc characteristic is proposed by ac measurement at low frequency which found that the result in the same of coloration mechanism due to the switching time.

Keywords: Electrochromic, smart material, ITO Glass, Redox reaction, Electrolyte