

Polythiophene based counter electrode for electrochromic windows fabricated with tungsten oxide film electrode

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INTRODUCTION

Among the electrochromic materials, tungsten oxide (WO_3) is one of the most promising materials for electrochromic devices, such as electrochromic windows (ECWs) because of its great durability in electrochromic properties¹⁾. On the other hand, electrochromic materials used for a counter electrode of a WO_3 film are not durable, compared to the WO_3 film. We then proposed the activated carbon-based counter electrode for a WO_3 film, and reported the excellent durability of the ECW fabricated with the electrode^{2, 3)}. The carbon-based counter electrodes are formed on a transparent conducting substrate in a dotted or striped pattern by screen-printing process, and practically transparent electrodes can be obtained. This process enables us to make large area transparent electrodes more efficiently and less expensively than conventional vacuum deposition

prepared by the same procedure is 50 Fg^{-1} , which is about 70 % of the p-MT-based electrode capacitance.

A transparent p-MT-based electrode was prepared by screen-printing method in a form of uniformly arrayed dots on an ITO-glass substrate and was cured at 200°C . The EC-cell size of $5 \text{ cm} \times 5 \text{ cm}$ was assembled with the transparent p-MT-based electrode thus obtained and the WO_3 deposited on an ITO-glass substrate. The interspace between two electrodes was filled with an electrolyte of 1 M LiClO_4 - γ -butyrolactone. Figure 2 shows the optical density (OD) change of the EC-cell monitored at 633 nm as a function of coloring/bleaching time. No significant degradation was observed during the coloring/bleaching cycles. Detailed results and discussion will be given in the presentation.

