

New tetrazine-based fluoro-electrochromic window ; modulation of the fluorescence through applied potential.

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General procedures. Chloromethoxytetrazine (CMTz) was prepared as previously reported,^{1,2} freshly before use. The electrochemical measurements were made with an universal potentiostat - Model CHI624B (CH Instrument Inc.), fitted with a two electrodes cell as described in the text. Fluorescence of the device was measured with luminescence spectrometer- Model LS55(PerkinElmer). Methoxy poly(ethylene glycol) 1000 monomethacrylate (MPEGM) was purchased from Polyscience Inc. PEGDME (Mw=550) and Triallyl-1,3,5-triazine-(1H,3H,5H)-trione (TATT) were obtained from Aldrich. TATT was used as a crosslinker. Lithium trifluoromethanesulfonate (LiTFS) was purchased from Merck. Darocure 1173 and Irgacure 784 (Ciba Specialty Chemicals) were used for photo-curing.

Preparation of polymer electrolyte and terazine blend. MPEGM (0.3g), PEGDME (0.6g), TATT (0.072g), 0.06g of Darocure 1173 and Irgacure 784 (0.003g) were mixed. 0.06g of LiTFS was added to the above mixture which was then stirred for 2h.³ TATT is the cross-linker and its proportion was 5% weight. One ITO plate was then spin-coated (300 rpm) with the above polymer, and the layer was cured afterwards for 10 min under UV light (210 nm). The thickness of the cured polymer electrolyte layer was 60 μm. To a separate polymer batch was added CMTz, and a second ITO plate was coated with the terazine blend and used without curing. The tetrazine dissolved easily in the polymer electrolyte mixture and its concentration was 5% in mass in this non cross-linked layer.

A laboratory U.V lamp (365nm 8.0mW, VILBER LOURMAT) was placed under the sample for fluorescence testing, and pictures were taken at regular intervals during the cycling of the films.

1. a) P. Audebert, F. Miomandre, G. Clavier, M.C. Vernieres, S. Badre, R. Meallet-Renault, *Chem. Eur. J.* **2005**, *11*, 5667. b) P. Audebert, S. Sadki, F. Miomandre and

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- G. Clavier, *Electrochem. Commun.*, **2004**, *6*, 144. P. Audebert, S. Sadki, F. Miomandre, G. Clavier, M. Saoud, M. C. Vernières and P. Hapiot, *New J. Chem.* **2004**, *28*, 387.
2. Z. Novak, B. Bostoi, M. Csekei, K. Lcrinez, A. Kotschy, *Heterocycles*, **2003**, *60*, 2653.
 3. E. Kim, S. Jung, *Chemistry of Materials*, **2005**, *17*, 6381.