Electrochromic and Electrofluorochromic Performance of Novel Polysiloxane bearing Tetraaniline and Fluorescein Groups

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Color and fluorescence dual-switching materials have recently attracted considerable attention of researchers, primarily because of their unique features in practical applications such as smart sensors, intelligent displays, multipurpose optical devices, and so on. Herein, a novel networked polysiloxane bearing tetraaniline and fluorescein groups (PSTF) was designed and synthesized via electrochemistry-assisted hydrolytic crosslinking reaction. The obtained porous interpenetrating PSTF film revealed expected electrochromic properties with clear color change, quick switching response, and acceptable coloration efficiency. By virtue of energy transfer between electroactive tetraaniline and photoluminescent fluorescein, PSTF film exhibited obvious fluorescent switching behavior under the applied potentials. Furthermore, the fluorescence switching upon acid/base substance was also revealed and investigated, ascribed to the variable molecular structure of PSTF.

Keywords: electrochromic; electrofluorochromic; polysiloxane; oligoaniline

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