Electroluminescence and Laser Emission of Soluble Pure Red Fluorescent Molecular Glasses Based on Dithienylbenzothiadiazole

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Résumé en anglais	Soluble molecular red emitters 1a/1b are synthesized by Stille coupling from 2-(3,5-di(1-naphthyl)phenyl)thiophene precursors. The compounds show emission maxima at ca. 610 nm in CH2Cl2 solution and 620 nm in solid films. Replacing the n-hexyl substituent by 4-sec-butoxyphenyl produces a marked increase of glass transition temperature (Tg) from 82 °C to 137 °C and increases the solubility in toluene and p-xylene, thus improving the film-forming properties. Cyclic voltammetry shows that the compounds can be reversibly oxidized and reduced around +1.10 and −1.20 V, respectively. A two-layered electroluminescent device based on 1b produces a pure red light emission with CIE coordinates (0.646, 0.350) and a maximal luminous efficiency of 2.1 cd A−1. Furthermore, when used as a solution-processed red emitter in optically pumped laser devices, compound 1b successfully produces a lasing emission at ca. 650 nm.
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