Short Note

N^1-(Benzo[b]thiophen-3-ylmethylidene)-N^2-(2-((2-((2-(benzo[b]thiophen-3-ylmethylidene)amino)ethyl)amino)ethyl)amino)ethyl)ethane-1,2-diamine

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Abstract: A novel probe L has been synthesized by classical Schiff-base reaction between 1-benzothiophene-3-carbaldehyde and tetraethylenepentamine as diamine. The structure of compound L was confirmed by melting point, elemental analysis, ESI-MS spectrometry, IR and ^13^C-NMR and ^1^H-NMR spectroscopy.

Keywords: imine compounds; amine compounds; benzothiophene units

The constant and growing interest in the development of new synthetic methods for the preparation of systems involving thiophene subunits is justified by their valuable physiological and pharmacological properties [1,2]. A large number of benzothiophene derivatives have been found to exhibit a wide variety of pharmaceutical properties such as anti-microbial [3], anti-cancer [4], and anti-HIV activity [5].

Since the last five years, our research group has been interested in the introduction of sulphur containing ligands into the skeleton of new fluorescent and colorimetric probes, and new active MALDI-TOF-MS molecules for sensing studies [6–11].
This paper describes the synthesis and characterization of a new benzothiophene di-imine probe (L), prepared by simple and classical Schiff-base reaction between 1-benzothiophene-3-carbaldehyde and tetraethylenepentamine (See scheme 1).

**Scheme 1.** Schematic representation of compound L.

Experimental

A solution of 1-benzothiophene-3-carbaldehyde (0.361 g, 2.108 mmol) in absolute ethanol (25 mL) was added drop wise to a refluxing solution of tetraethylenepentamine (0.199 g, 1.054 mmol) in the same solvent (35 mL). The resulting solution was gently refluxed with magnetic stirring for ca. 4 h. During that period the color changed from yellow to green. The resulting solution was concentrated under vacuum to 1/3 of its original volume. Diethyl ether was added to form a green precipitate that was filtered off and dried under vacuum. The compound isolated was characterized as chemosensor L.

Melting point: 123–125 °C.

Yield: 395 mg (L) (78%).

ESI-MS: m/z (rel. int%): 478.20 (100) [L+H]⁺.

1H-NMR (CDCl₃) (L): δ = 8.2 (s, 2H, C–H) thiophene; 8.0–7.8 (m, 8H, C–H, Ar); 7.2 (s, 2H, N=C–H); 3.8–3.2 (m, 12H, CH₂); 2.6–2.2 (m, 4H, CH₂); 1.8 (s, 3H, NH) ppm.

13C-NMR (CDCl₃) (L): δ = 160.8; 139.9; 127.9; 126.4; 124.4; 124.3; 123.2; 122.8; 119.7; 55.3; 50.2; 49.0.

IR (cm⁻¹) (L): 3036 (C–H, Ar), 1645 (C=N, Imine), 1598, 1493 (C=C, Ar).

Elemental analysis: Calcd for C₂₆H₃₁N₅S₂·2H₂O: C, 60.79; H, 6.87; N,13.63. Found (L): C, 60.95; H, 7.20; N, 13.75.

Uv-vis (CHCl₃), [L] = 1.00 ×10⁻⁵ M, λ_max 287 and 302 nm. Non-emissive.

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References and Notes


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