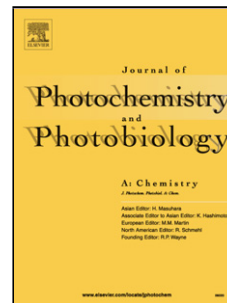


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A new green fluorescent tripod based on 1,8-naphthalimide. Detection ability for metal cations and protons and antimicrobial activity

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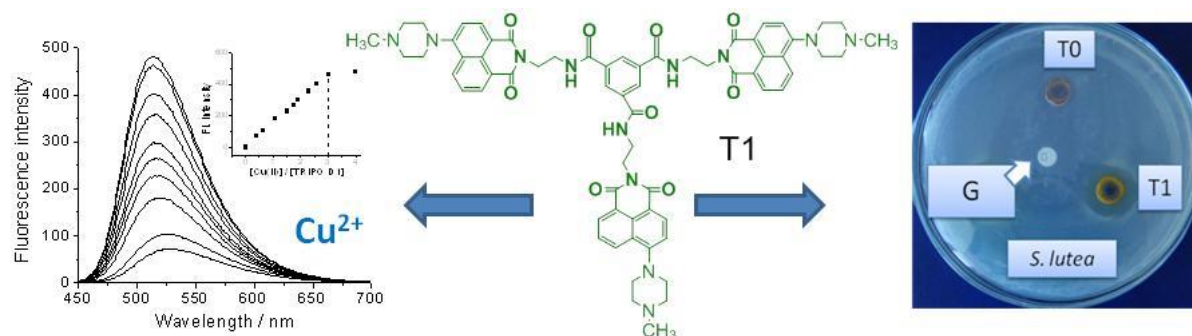
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Graphical Abstract



Highlights

- New naphthalimide tripod with chemosensor capacity for metal ions and protons.
- The synthesis of a new copper complex $[Cu_3(T1)(NO_3)_6]$ has been described.
- Free ligand and copper complex demonstrate antibacterial and antifungal activity.

Abstract:

A new fluorescent tripod containing three symmetrical 1,8-naphthalimide units has been synthesized. The photophysical characteristics have been investigated in organic solvents of different polarity. The ability of the tripod to detect metal ions (Pb^{2+} , Zn^{2+} , Ni^{2+} and Cu^{2+}) has been investigated in acetonitrile solution. The influence of pH on the tripod fluorescence intensity has also been studied in an ethanol - water (1:4 v/v) solution. The antimicrobial activity of the new tripod was investigated against Gram-positive and Gram-negative bacteria and yeasts using the agar diffusion method. The antimicrobial effect of the new compounds was also investigated upon their deposition on cotton fabric. The chemical structure of the tripod as a determining factor for its antimicrobial activity was discussed.

Keywords: 1,8-naphthalimide; ; ; ; , tripod, PET, sensor, metal complex, antibacterial activity

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Introduction

Biologically important metal ions are of great importance for the vitality of plants, animals and humans. However, accumulation of such ions at concentrations higher than the one needed for the development of organisms leads to pathological changes [1-3]. Currently an intensive research has been done on fluorescent compounds able to change their spectral characteristics in response to changes in the environment. The creation of such systems able to register changes in the chemical and physical properties of the medium has been one of the most vanguard modern scientific and technological fields with regard to the particular importance of those devices for the health care and environment protection [4-6].

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