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Elena A. Kuzmina, Tatiana V. Dubinina, Alexander V. Dzuban, Vitaly I. Krasovskii, Olga A. Maloshitskaya, Larisa G. Tomilova

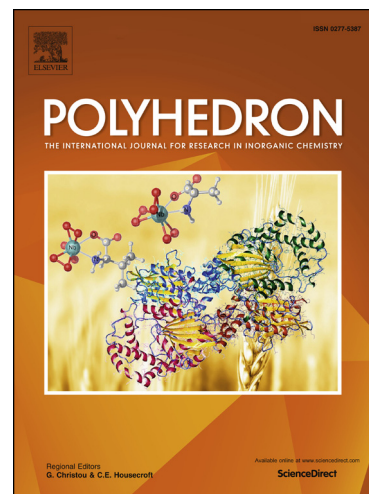
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Perchlorinated europium, terbium and lutetium mono(phthalocyaninates):  
synthesis, investigation of thermal stability and optical properties

Elena A. Kuzmina <sup>a</sup>, Tatiana V. Dubinina <sup>a,b, \*</sup>, Alexander V. Dzuban <sup>a</sup>, Vitally I. Krasovskii <sup>c</sup>,  
Olga A. Maloshitskaya <sup>a</sup>, Larisa G. Tomilova <sup>a,b</sup>

<sup>a</sup> Department of Chemistry, Lomonosov Moscow State University, 1 Leninskie Gory, 119991 Moscow, Russian Federation. Fax: +7 495 939 0290; Tel: +7 495 939 1243; E-mail: [dubinina.t.vid@gmail.com](mailto:dubinina.t.vid@gmail.com).

<sup>b</sup> Institute of Physiologically Active Compounds, Russian Academy of Sciences, 1 Severny proezd, 142432 Chernogolovka, Moscow Region, Russian Federation. Fax: +7 496 524 9508; E-mail: [tom@org.chem.msu.ru](mailto:tom@org.chem.msu.ru).

<sup>c</sup> Prokhorov General Physics Institute of the Russian Academy of Sciences, 119991, 38, Vavilov Street, Moscow, Russian Federation

## ABSTRACT

A novel hexadecachloro-substituted terbium(III) phthalocyaninate was synthesised and identified by mass-spectrometry, infrared and UV/Vis spectroscopies. Its elemental composition was proved using high resolution mass spectrometry, while thermal analysis revealed sufficiently high thermal stability up to 220 °C. For the first time for lanthanide(III) mono(phthalocyaninates), the influence of the lanthanide ion nature on the nonlinear optical properties was investigated. The values of the absorption cross-sections of the first excited state were determined using the z-scan technique. The highest value ( $\sigma_1 = 1.96 \times 10^{-16} \text{ cm}^2$ ) was observed for the terbium complex.

**Keywords:** Phthalocyanine / Halogen / Lanthanide / Nonlinear optical properties / UV-Vis spectroscopy

## 1. Introduction

The presence of electron-withdrawing substituents in the peripheral and non-peripheral positions of the phthalocyanine macrocycle leads to unique physico-chemical properties, resulting in the

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