

Publication

Air-stable Solid-state Photoluminescence Standards for Quantitative Measurements Based on 4'-phenyl-2,2':6',2''-Terpyridine Complexes with Trivalent Lanthanides

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Correct photoluminescence quantum yield (PLQY) determination in the solid state is vital for numerous application fields, such as photovoltaics, solid lighting or the development of phosphors. In order to increase the limited number of suitable standards for such determinations, two new Ln³⁺-based complexes with 4''-phenyl-2,2' : 6'',2''-terpyridine γ -[Ln 4 (OAc) 12 (ptpy) 2] (1-Eu with europium and 1-Tb with terbium) are presented. The corresponding complexes show solid-state QYs of 58(4) % and 46(3) %, respectively, exhibiting broadband absorption in the UV range from 380-200 nm. As Ln³⁺ ions in general exhibit narrow f - f transitions, spectral regions with a broadness of 20-35 nm can be checked. Both complexes have suitable thermal stability, up to 270 °C, and are stable with respect to air and humidity, for 1-Eu up to 75 % and for 1-Tb up to 53 % relative humidity. These complexes are altogether suitable as standards to increase the reliability of PLQY determination and proposed to be used for a relative PLQY determination in the solid state

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