



Cerium Based Phosphor Materials for Improved Light Quality in LEDs

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BRIEF DESCRIPTION

A novel luminescent cerium compound that emits bright red light when used as a phosphor.

BACKGROUND

LEDs based on wide band gap semiconductor materials such as GaN or InGaN produce UV/blue light with high efficiency and long lifetimes. This light can be converted into needed colors using the luminescence properties of phosphor materials. Therefore, white LED devices can be created by combining either a blue LED and a yellow phosphor or a UV LED with Red/Green/Blue (RGB) phosphors. Consequently, new discoveries in yellow and red phosphors are essential for improving the efficiency and light quality of LED-based solid state lighting devices. Cerium-based compounds usually emit UV or blue light with few exceptions in the green/yellow region, but cannot be used to emit bright red light.

DESCRIPTION

Researchers at the University of California, Santa Barbara have discovered a novel luminescent cerium compound that emits bright red light when used as a phosphor. This compound can be applied to enhance the light quality of systems using a blue LED with a yellow/green phosphor. It can also be utilized as the red phosphor in a system using a UV LED and RGB phosphors. Due to the chemical makeup, there is a decrease of the emission wavelength towards the yellow/orange region and thus it can be used directly as the yellow phosphor with a blue LED.

ADVANTAGES

- Improved efficiency
- Improved light quality

CONTACT

University of California, Santa
Barbara Office of Technology &
Industry Alliances
padilla@tia.ucsb.edu
tel: 805-893-2073.

INVENTORS

- ▶ Cheetham, Anthony K.
- ▶ Le Toquin, Ronan P.

OTHER INFORMATION

KEYWORDS

phosphor, cerium, GaN, LED,
indssl, indphosphor

CATEGORIZED AS

- ▶ **Materials & Chemicals**
- ▶ Other
- ▶ **Optics and Photonics**
- ▶ All Optics and
Photonics

RELATED CASES

2005-618-0

APPLICATIONS

- LEDs

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,920,676	12/30/2014	2005-618

