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Stand-Alone Ceramic Phosphor Composites for Laser-Excited Solid-**State White Lighting**

Tech ID: 26025 / UC Case 2016-99P-0

BRIEF DESCRIPTION

A method for generating a stand-alone ceramic phosphor composite for use in solid state white light generating devices that successfully reduces the operating temperature of the phosphor material by 50%, increases lumen output, reduces cost of materials, and decreases preparation time.

BACKGROUND

Current phosphor encapsulation schemes involve a resin or glass component that caps the maximum operating temperature of the device to avoid thermal instability. Therefore, while organic resins and glasses are appropriate for light emitting diodes that operate at low temperatures, they are not suitable for the higher flux imposed by high power LEDs or laser diodes (LDs). The realization of encapsulation-free phosphor ceramics is required for the next generation of laser-based white lighting due to the temperature limitations of resins.

DESCRIPTION

Researchers at the University of California, Santa Barbara have created a method for generating a stand-alone ceramic phosphor composite for use in solid state white light generating devices that successfully reduces the operating temperature of the phosphor material by 50%, increases lumen output, reduces cost of materials, and decreases preparation time. The compound consists of a phosphor material and a filler oxide. The phosphor material is a UV and blue absorbing inorganic phosphor that efficiently converts blue light to yellow. The method uses spark plasma sintering (SPS) material preparation that promotes densification in less than 30 minutes, resulting in very dense and robust samples.

ADVANTAGES

- Drastically lower operating temperatures
- Increased light output
- Reduced manufacturing costs and time
- Decreased preparation time

APPLICATIONS

- Light Emitting Diodes (LEDs)
- Laser Diodes (LDs)

Permalink

CONTACT Pasquale S. Ferrari ferrari@tia.ucsb.edu tel: .

INVENTORS

Cozzan, Clayton J.

Seshadri, Ram

OTHER INFORMATION

KEYWORDS indfeat, Solid state white light, Phosphor, indadvmat

CATEGORIZED AS

- Energy
 - Lighting
- Engineering
 - Engineering

RELATED CASES 2016-99P-0

Phosphors

PATENT STATUS

Country	Туре	Number	Dated	Case
United States Of America	Issued Patent	11,286,419	03/29/2022	2016-99P

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

▶ Thermally Stable, Laser-Driven White Lighting Device

University of California, Santa Barbara Office of Technology & Industry Alliances 342 Lagoon Road, ,Santa Barbara,CA 93106-2055 https://www.tia.ucsb.edu Tel: 805-893-2073 Fax: 805.893.5236 padilla@tia.ucsb.edu	Y	in	© 2016 - 2022, The Regents of the University of California Terms of use Privacy Notice
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