TRANSLATIONAL RESEARCH & INNOVATION CENTRE (TRIC-KU)
UNIVERSITY OF KERALA

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Application for calling for “Expression of interest” for technology transfer by TRIC-KU University of Kerala

DOUBLE PEROVSKITE TELLURATES AND THE USE THEREOF IN THE FABRICATION OF CYAN EMITTING LEDS

1 Name of the inventor(s):

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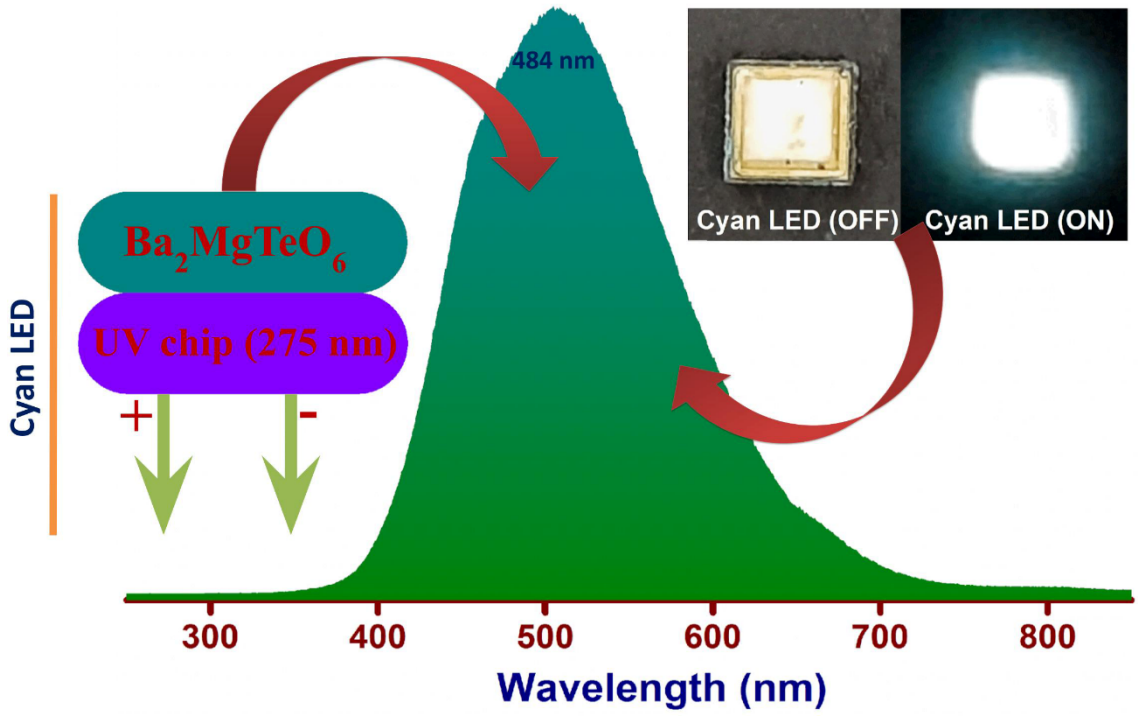
2. Abstract of the invention (100-200 words):

There is provided a light emitting device that emits cyan light. The LED includes a radiation source and a luminescent material. The emitted light from cyan LED originates from the self-activated emission of luminescent material Ba_2MgTeO_6 (BMTO). The commonly available phosphor converted LEDs are based on the luminescence of activator ions in the phosphor material. For now, the unusual emission obtained in the Ba_2MgTeO_6 phosphor is used for the fabrication of novel cyan emitting LED, and the said LED is the first LED based on the self-activated tellurate emission. The said LED is highlighted by neither using an activator ions nor using any blue LED chips. The cyan emitting LED emits highly intense broad light in the range of 350-750 nm with the emission maxima at 484 nm. The CIE coordinates of the LED emission was obtained as (0.26, 0.37) at 20 mA, which ensure a cyan light.

3. Graphical representation of the invention:



4. State the clauses that have been protected:

CLAIMS

1. A light emitting device comprising a UV radiation source and a converting material, wherein the said converting material is a single-phase luminescent material belonging to the class of undoped tellurate double perovskites, which emits light in the visible region without the aid of any additional activators or guest material, by absorbing a part of the light from the radiation source.

2. The device as claimed in claim 1, wherein the undoped tellurate phosphor has a chemical composition Ba_2MgTeO_6, where the light from the device has a broad emission in the cyan region and is originating from the unusual photoluminescence of activator free Ba_2MgTeO_6 material.

3. The device as claimed in claim 1, wherein it emits light in 350-750 nm region with the emission maxima at 484 nm with a higher full width at half maximum of 130 nm under 20 mA input bias current.

4. The device as claimed in claim 1, wherein the emitted light has the CIE coordinates of (0.26, 0.37) corresponding to cyan region.

5. The device as claimed in claim 1 exhibits intense and stable emission in the broad region under various input bias current from 5 to 50 mA, exhibiting superior color stability even at higher input bias currents.

6. The device as claimed in claim 1, wherein the Ba_2MgTeO_6 material provides an emission tunability ranging from visible to the NIR region with respect to the change in excitation wavelength from near UV to blue region.

7. The device as claimed in claim 1, wherein the converting luminescent material Ba_2MgTeO_6 has a decay time of 0.05 ms under 268 and 484 nm excitation and emission wavelength respectively.

8. The device as in claim 1, wherein the undoped Ba_2MgTeO_6 converting material has a quantum yield of 49 %.

9. The device as in claim 1, wherein the converting/luminescent material Ba_2MgTeO_6 has an activation energy of 0.40 eV, a higher thermal stability.

13. Has the patent been published in a research journal: No

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