Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.
This journal is © The Royal Society of Chemistry 2019

# Highly Efficient Dual Broad Emitting Light Convertor: An Option for Next-Generation Plant Growth LEDs

Mingcai Li, [a] Xuejie Zhang, [a] Haoran Zhang,*[a] Weibin Chen, [a] Li Ma,[b] Xiaojun Wang,[b] Yingliang Liu[a] and Bingfu Lei[a]*

[a] Guangdong Provincial Engineering Technology Research Center for Optical Agricultural, College of Materials and Energy, South China Agricultural University, Guangzhou 510642, China.
[b] Department of Physics, Georgia Southern University, Statesboro, GA 30460, USA.

*Corresponding authors.
E-mail addresses: tleibf@scau.edu.cn (B.F. Lei)

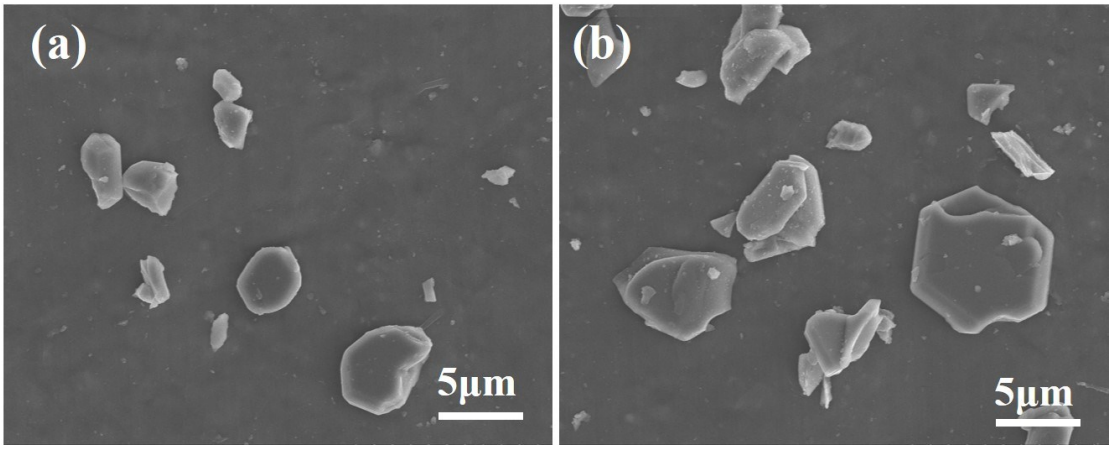


**Figure S1.** (a) –(b) SEM of BAM phosphor

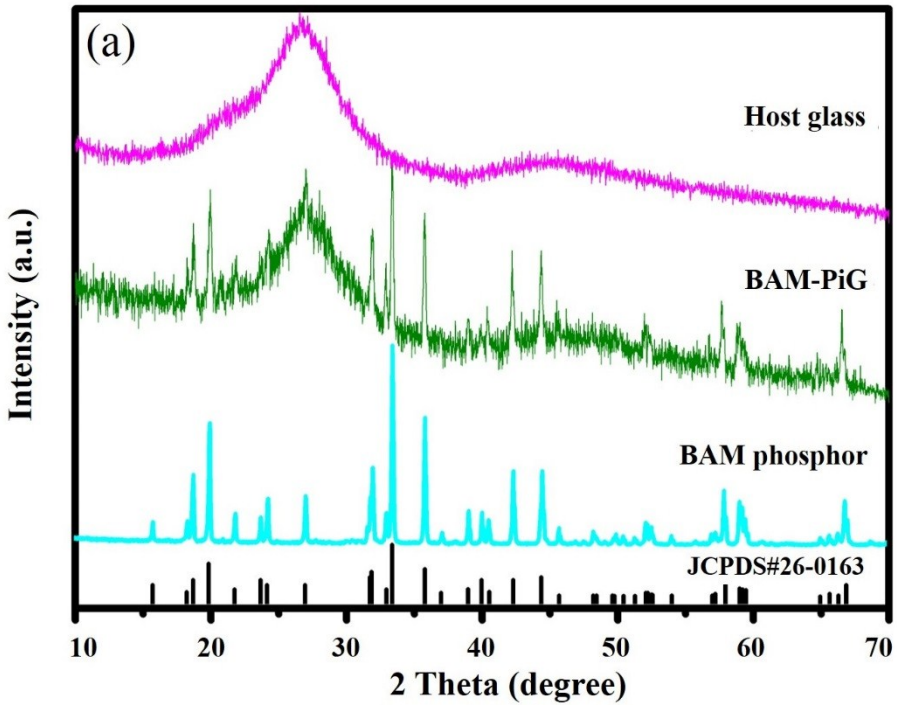


**Figure S2.** (a) XRD patterns of host glass, BAM-PiG and BAM-Phosphor.

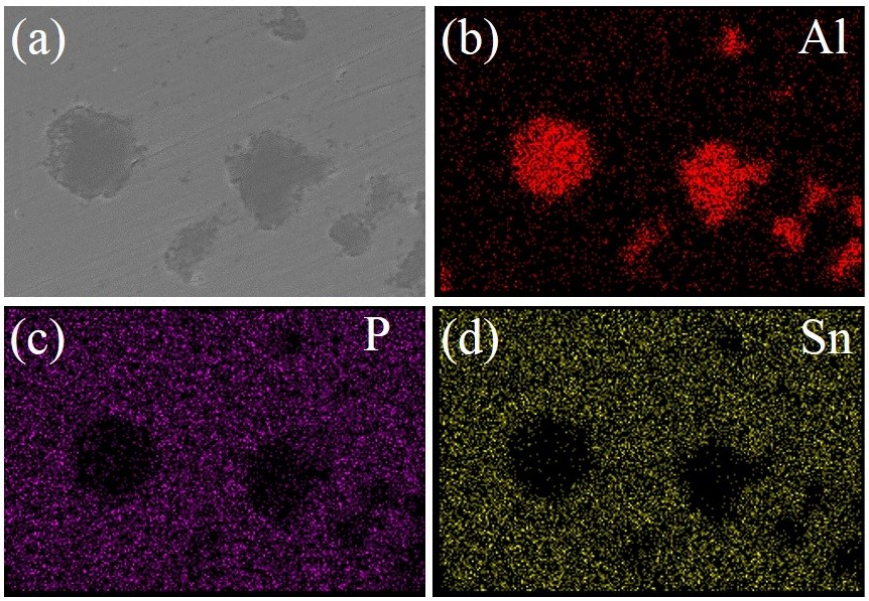


**Figure S3.** (a-d) EDS mapping images of BAM-PiG.

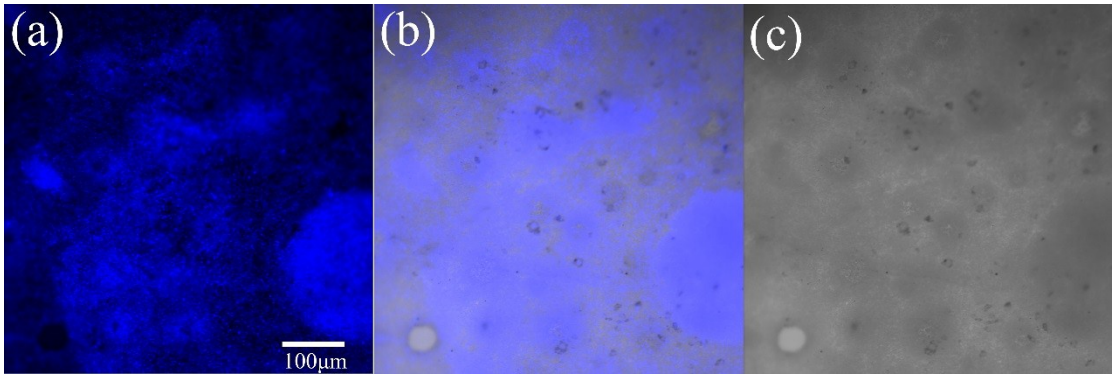


**Figure S4.** (a) CLSM images of BAM-PiG; (b) The superposition of brightfield and darkfield; (c) only darkfield.

**Table S1.** The quantum efficiency of CASN-PiG, BAM-PiG and Dual-PiGP under different phosphor content

| Samples | 0.1% | 0.5% | 1.0% | 1.5% | 2.0% |
|---|---|---|---|---|---|
| CASN-PiG | 29.10 | 62.62 | 71.82 | 84.54 | 94.42 |
| BAM-PiG | 15.22 | 50.32 | 76.31 | 83.70 | 93.5 |
| Dual-PiGP | 25.32 | 58.51 | 72.93 | 85.22 | 93.90 |

**Table S2.** The quantum efficiency of Dual-PiGP and Mixture-PiG under different phosphor content

| Samples | 0.1% | 0.5% | 1.0% | 1.5% | 2.0% |
|---|---|---|---|---|---|
| Dual-PiGP | 25.31 | 58.51 | 72.94 | 85.26 | 93.90 |
| Mixture-PiG | 22.92 | 50.31 | 58.42 | 73.30 | 81.12 |