



US 20240215280A1

(19) **United States**

(12) **Patent Application Publication**
LEE et al.

(10) **Pub. No.: US 2024/0215280 A1**

(43) **Pub. Date: Jun. 27, 2024**

(54) **IN SITU CORE/SHELL PEROVSKITE
NANOCRYSTAL MATERIAL, METHOD OF
PREPARATION THEREOF, AND LIGHT
EMITTING DEVICE COMPRISING THE
SAME**

(71) Applicants: **SEOUL NATIONAL UNIVERSITY
R&DB FOUNDATION**, Seoul (KR);
PEROLED Co., Ltd., Seoul (KR)

(72) Inventors: **Tae-Woo LEE**, Seoul (KR); **Joo Sung
KIM**, Seoul (KR)

(21) Appl. No.: **18/419,535**

(22) Filed: **Jan. 22, 2024**

Related U.S. Application Data

(63) Continuation-in-part of application No. 18/485,135,
filed on Oct. 11, 2023.

(30) **Foreign Application Priority Data**

Oct. 31, 2022 (KR) 10-2022-0142652
Oct. 31, 2023 (KR) 10-2023-0148391

Publication Classification

(51) **Int. Cl.**
H10K 50/11 (2006.01)
B82Y 20/00 (2006.01)
H10K 50/15 (2006.01)
H10K 85/50 (2006.01)

(52) **U.S. Cl.**
CPC **H10K 50/11** (2023.02); **B82Y 20/00**
(2013.01); **H10K 50/15** (2023.02); **H10K**
85/50 (2023.02)

(57) **ABSTRACT**

The present inventive concept relates to an in situ core/shell perovskite nanocrystal film formed by an in situ nanocrystal synthesis process, a method for producing the same, and a light emitting device comprising the same as a light-emitting layer. The in situ core/shell perovskite nanocrystal film formed by the in situ nanocrystal synthesis process according to the present inventive concept exhibits a strong charge confinement effect by nanocrystal formation, and can simultaneously greatly improve the luminescence efficiency and lifetime by maintaining the fast charge transport capability of polycrystalline perovskite.

