



US 20240244856A1

(19) **United States**

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

(10) **Pub. No.: US 2024/0244856 A1**

(43) **Pub. Date: Jul. 18, 2024**

(54) **ORGANIC ELECTROLUMINESCENCE
ELEMENT, ELECTRONIC APPARATUS, AND
PRODUCTION METHOD FOR ORGANIC
ELECTROLUMINESCENCE ELEMENT**

H10K 101/00 (2006.01)

H10K 101/10 (2006.01)

H10K 101/30 (2006.01)

(52) **U.S. Cl.**

CPC **H10K 50/11** (2023.02); **C09K 11/06**

(2013.01); **H10K 85/342** (2023.02); **H10K**

85/626 (2023.02); **H10K 85/633** (2023.02);

H10K 85/6574 (2023.02); **H10K 85/658**

(2023.02); **C09K 2211/185** (2013.01); **H10K**

2101/10 (2023.02); **H10K 2101/30** (2023.02);

H10K 2101/90 (2023.02)

(71) Applicant: **IDEMITSU KOSAN CO.,LTD.**, Tokyo
(JP)

(72) Inventors: **Kengo KISHINO**, Tokyo (JP); **Satomi
TASAKI**, Tokyo (JP); **Kazuki
NISHIMURA**, Tokyo (JP); **Yoshiaki
TAKAHASHI**, Tokyo (JP)

(73) Assignee: **IDEMITSU KOSAN CO.,LTD.**, Tokyo
(JP)

(57)

ABSTRACT

An organic EL device includes an anode, a cathode, and an emitting layer disposed between the anode and the cathode, in which the emitting layer includes a first emitting layer and a second emitting layer, the first emitting layer contains a first host material and a first luminescent compound, the second emitting layer contains a second host material and a second luminescent compound, the first host material and the second host material are mutually different, the first luminescent compound and the second luminescent compound are mutually the same or different, a triplet energy of the first host material $T_1(H1)$ and a triplet energy of the second host material $T_1(H2)$ satisfy a relationship of Numerical Formula 1, and a diffusion coefficient D_1 of the triplet energy of the first host material $T_1(H1)$ calculated according to a diffusion equation is 3.0×10^{-9} (cm²/s) or more,

(21) Appl. No.: **18/281,298**

(22) PCT Filed: **Mar. 9, 2022**

(86) PCT No.: **PCT/JP2022/010266**

§ 371 (c)(1),

(2) Date: **Sep. 10, 2023**

(30) **Foreign Application Priority Data**

Mar. 11, 2021 (JP) 2021-038971

Mar. 11, 2021 (JP) 2021-039399

Publication Classification

(51) **Int. Cl.**

H10K 50/11 (2006.01)

C09K 11/06 (2006.01)

H10K 85/30 (2006.01)

H10K 85/60 (2006.01)

$$T_1(H1) > T_1(H2).$$

(Numerical Formula 1)

