

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2024/0215443 A1 YOSHIYASU et al.

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

(54) ORGANIC COMPOUND AND LIGHT-EMITTING DEVICE

(71) Applicant: SEMICONDUCTOR ENERGY LABORATORY CO., LTD., Atsugi-shi

(JP)

(72) Inventors: Yui YOSHIYASU, Atsugi (JP);

Nobuharu OHSAWA, Zama (JP); Hiromitsu KIDO, Atsugi (JP); Masatoshi TAKABATAKE, Atsugi (JP); Satoshi SEO, Sagamihara (JP)

(21) Appl. No.: 18/525,103

(22)Filed: Nov. 30, 2023

(30)Foreign Application Priority Data

Nov. 30, 2022	(JP)	 2022-192372
Dec. 1, 2022	(JP)	 2022-193138
Ian 13 2023		2023 003/150

Publication Classification

(51) Int. Cl.

H10K 85/60 (2006.01)C07D 209/86 (2006.01)

C07F 7/08	(2006.01)
C09K 11/06	(2006.01)
H10K 85/40	(2006.01)

(52) U.S. Cl.

CPC H10K 85/6572 (2023.02); C07D 209/86 (2013.01); C07F 7/0812 (2013.01); C09K 11/06 (2013.01); H10K 85/40 (2023.02); H10K 50/11 (2023.02)

(57)**ABSTRACT**

A highly efficient and highly reliable light-emitting device is provided. The light-emitting device includes an organic compound layer between a pair of electrodes. The organic compound layer includes a light-emitting layer, the lightemitting layer includes a first organic compound, a second organic compound, and a light-emitting substance, the first organic compound contains deuterium, and in a PL measurement of a mixed layer of the first organic compound and the second organic compound, a spectrum of an exciplex is observed at room temperature, and a spectrum of the exciplex is not observed at a temperature in a temperature range of 4 K to 80 K, inclusive.



