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Electronic Supplementary Information

Reliable thin-film encapsulation of flexible OLEDs and enhancing their bending characteristics through mechanical analysis

Yun Cheol Han[a], Eun Gyo Jeong[a], Hyuncheol Kim[a], Seonil Kwon[a], Hyeon-Gyun Im[b], Byeong-Soo Bae[b], and Kyung Cheol Choi[*a]

[a]School of Electrical Engineering, Korea Advanced Institute of Science and Technology (KAIST), 291 Daehak-ro, Yuseong-gu, Daejeon 305-701, Republic of Korea. E-mail: kyungcc@kaist.ac.kr

[b]Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST),291 Daehak-ro, Yuseong-gu, Daejeon 305-701, Republic of Korea.

Table 1. Young's modulus and film thickness used in FEA of multi-layer structure

Materials	Young's modulus (GPa)	Poisson's ratio	Thickness
Hybrimer	4	0.3	Variable (0 ~ 200 μm)
S-H nanocomposite	4	0.3	120 nm
Al_2O_3	150	0.22	30 nm
Al	70	0.36	100 nm
Alq_3	2	0.3	50 nm
NPB	2	0.3	50 nm
Ag	85	0.37	7 nm
ZnS	128	0.27	25 nm
PET	3.2	0.3	125 μm

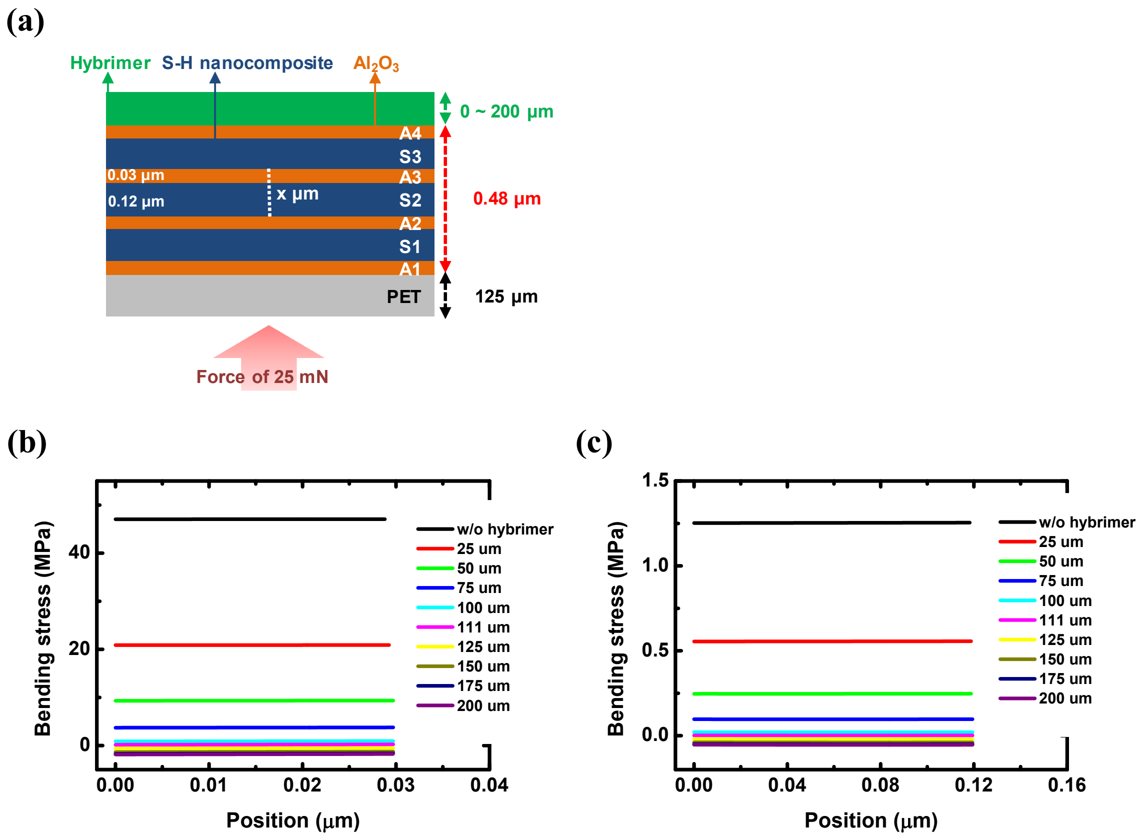

Fig. S1 (a) Schematic of moisture barrier structure on PET substrate. Bending stress distribution along the vertical dashed line of (b) Al_2O_3 layer and (c) S-H nanocomposite layer. Each layer is indicated as A3 and S2, respectively. The bottom of each layer is used as a reference for the x-axis.

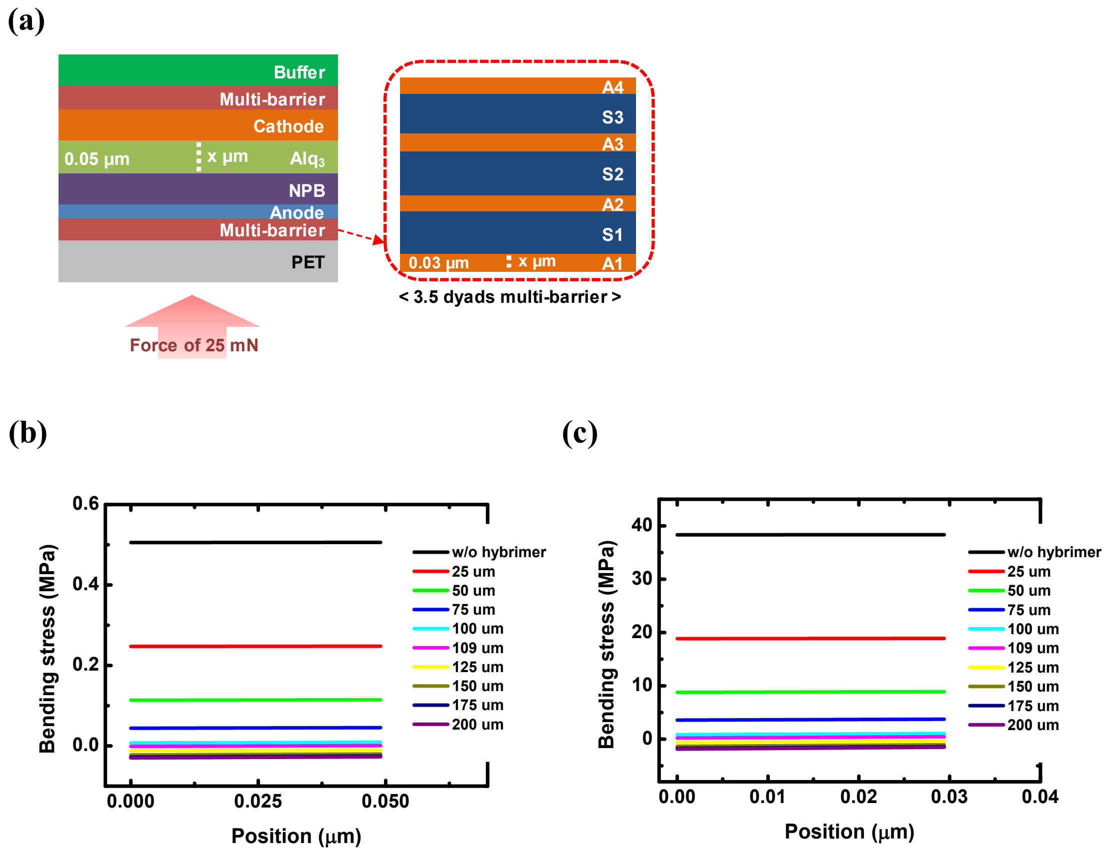

Fig. S2 (a) Schematic of encapsulated FOLEDs structure on PET substrate. Bending stress distribution along the vertical dashed line of (b) Alq_3 layer and (c) Al_2O_3 layer. The Al_2O_3 layer is indicated as A1. The bottom of each layer is used as a reference for the x-axis.

Fig. S1 and Fig. S2 show the bending stress distribution of the moisture barrier and encapsulated FOLED structures, respectively. The bending stress was calculated along the white dashed line, which is positioned at the center of each layer. Even though the bending stress varied in relation to changes in the hybrimer thickness, the bending stress was linearly distributed over the corresponding layer thickness, regardless of the hybrimer thickness. As reference of certain thickness of hybrimer of 111μm for the moisture barrier and 109 μm for the encapsulated FOLED structures, the bending stress type was converted between compressive and tensile stress.