

Article

Highly Transparent Red Organic Light-Emitting Diodes with AZO/Ag/AZO Multilayer Electrode

Dongwoon Lee ^{1, †}, Min Seok Song ^{1, †}, Yong Hyeok Seo ¹, Won Woo Lee ¹, Young Woo Kim ¹, Minseong Park ², Ye Ji Shin ², Sang Jik Kwon ¹, Yongmin Jeon ^{2,*}, and Eou-Sik Cho ^{1,*}

¹ Department of Electronics Engineering, Gachon University, Seongnam 13120, Republic of Korea.

² Department of Biomedical Engineering, Gachon University, Seongnam 13120, Republic of Korea.

* Correspondence: yongmin@gachon.ac.kr (Yongmin Jeon), es.cho@gachon.ac.kr (Eou-Sik Cho)

† These authors contributed equally to this work.

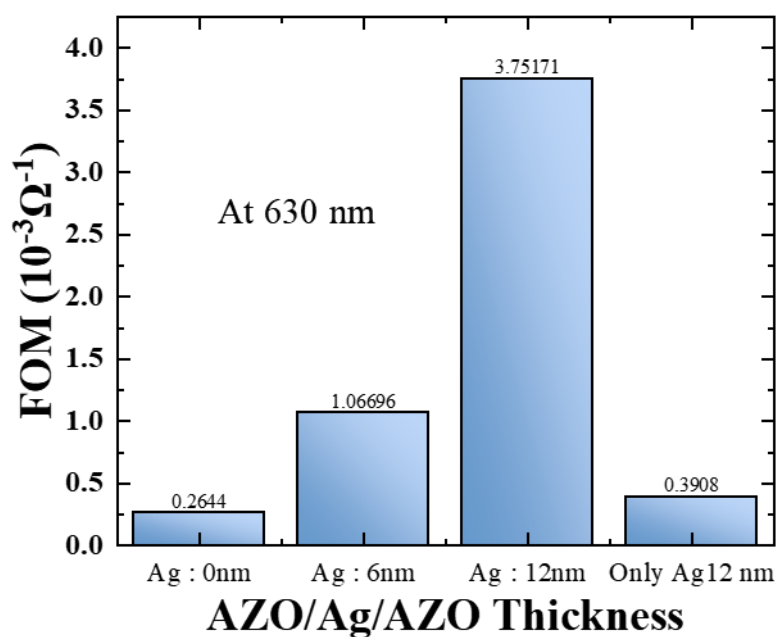


Figure S1. FOM value of the AZO/Ag/AZO at a wavelength of 630 nm according to the Ag thickness in Figure 1d.

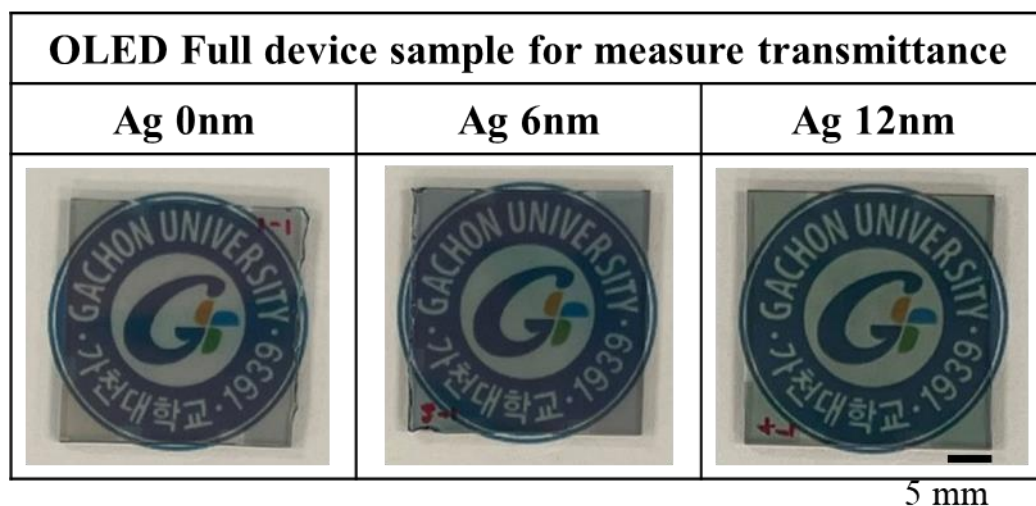


Figure S2. Optical imagery of the transparent red OLED for different Ag thickness in the AZO/Ag/AZO anode.

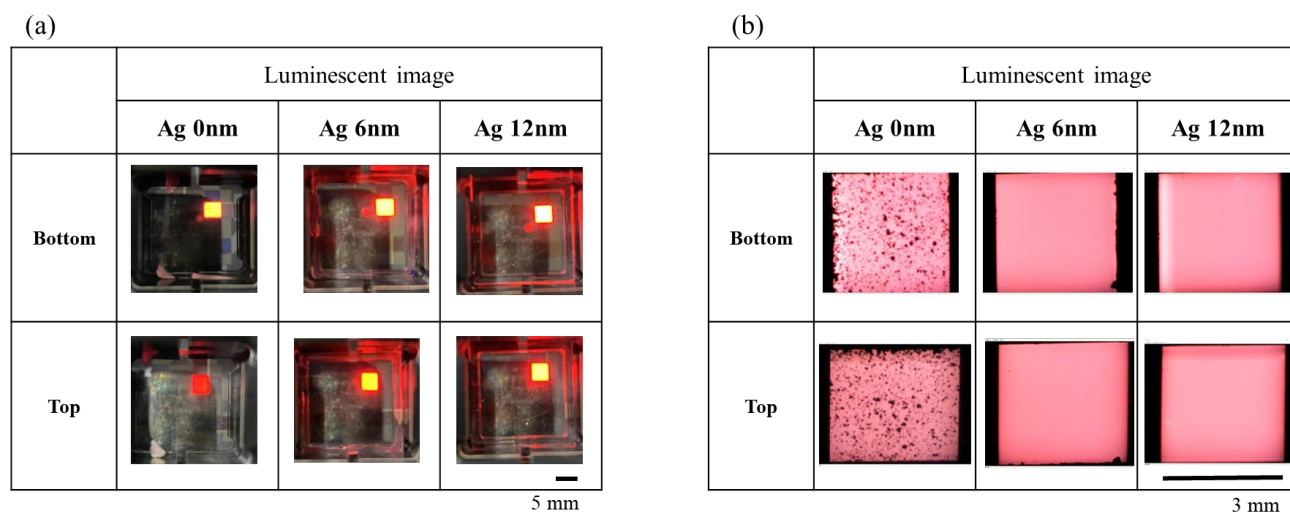


Figure S3. Luminescent imagery of the fabricated red OLED in both the top and bottom directions: (a) normal size, and (b) magnified size.

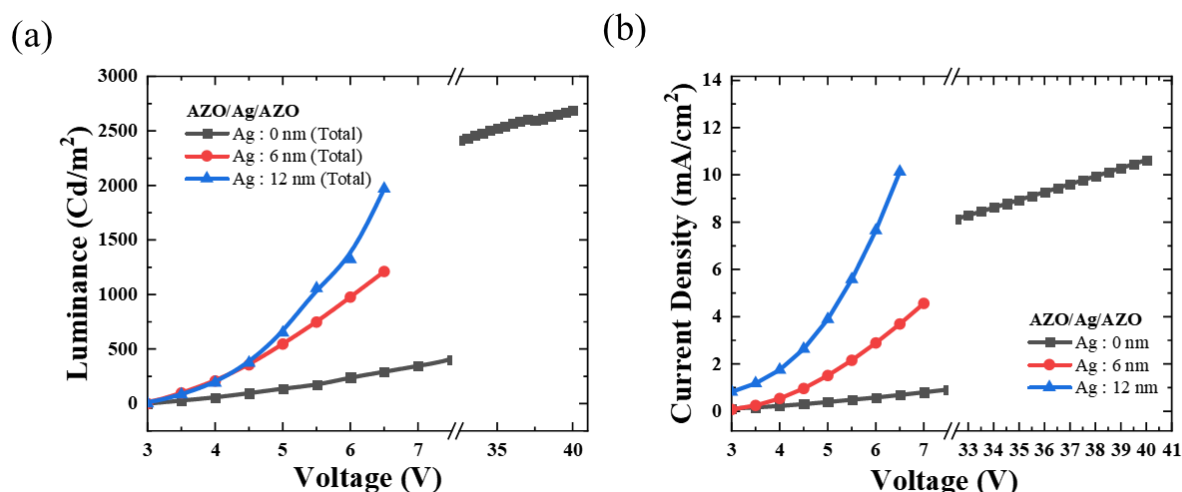


Figure S4. Analysis of the total emission characteristics of the fabricated transparent red OLED with different Ag thickness in the AZO/Ag/AZO anode: (a) The luminance–voltage characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode; (b) the current density – voltage characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode.

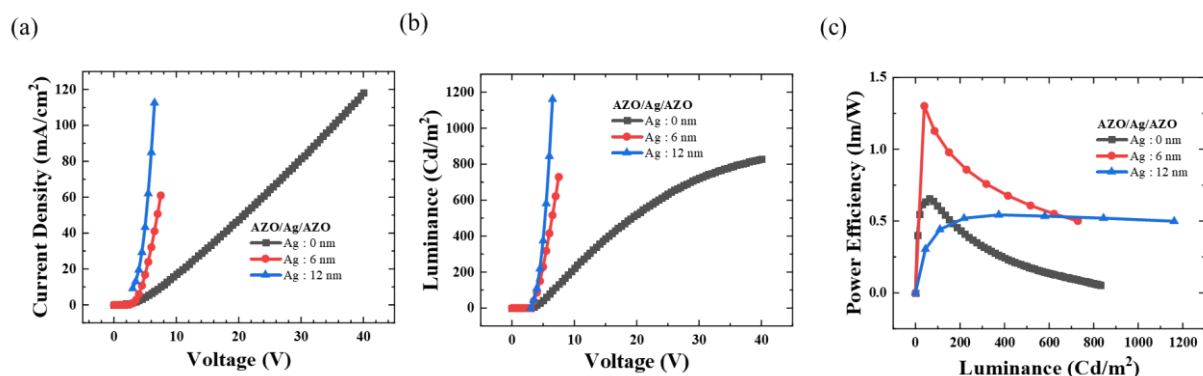


Figure S5. Analysis of the total emission characteristics of the fabricated transparent red OLED with different Ag thickness in the AZO/Ag/AZO anode: (a) the current density – voltage characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode; (b) The luminance–voltage characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode; and (c) the power efficiency – luminance characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode.

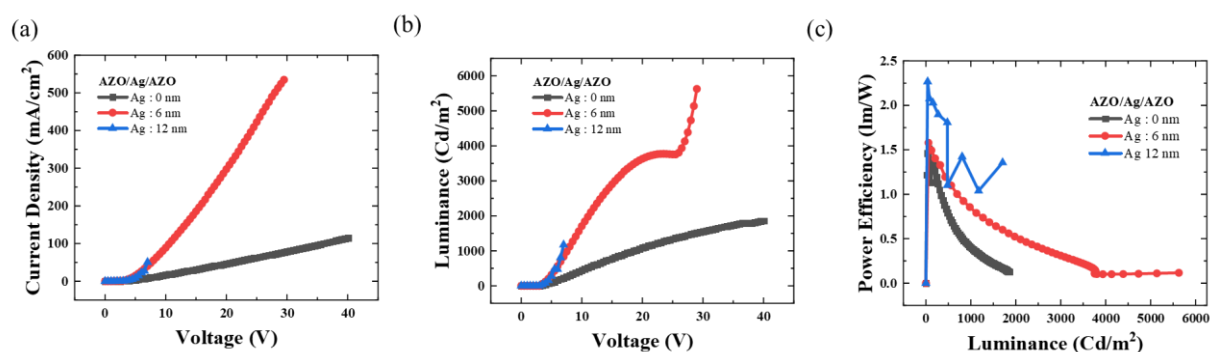


Figure S6. Analysis of the bottom emission characteristics of the fabricated transparent red OLED with different Ag thickness in the AZO/Ag/AZO anode: (a) the current density – voltage characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode; (b) the luminance–voltage characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode; and (c) the power efficiency – luminance characteristics of the fabricated red OLED for different Ag thickness in the AZO/Ag/AZO anode.