Supporting Information

Title: A Transparent Composite Electrode Composed of AgCr and Mo-Doped GaZnO to Realize Flexible Bottom-Emitting OLEDs

Meng-Hsuan Chiu, Dun-Cheng Huang, Cheng-Yung Ho, I-Hsuan Chaung, Yi-Ching Chen, Tzu-Hsin Hsiao, Chih-Hao Chang*

Department of Electrical Engineering, Yuan Ze University, Chungli 32003, Taiwan.

To whom to correspond:

E-mail: chc@saturn.yzu.edu.tw (C.-H. Chang); Tel: 886-3-4638800-7517

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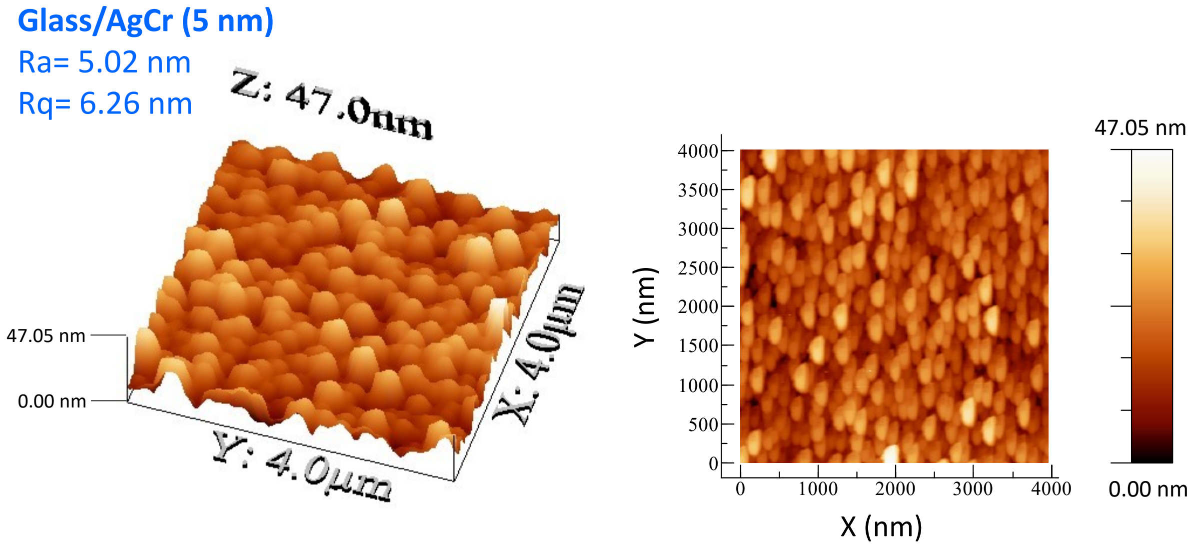

Figure S1. AFM images of AgCr (5 nm) on the glass substrate.

Table S1. Electrical, optical properties, and figure of merit (FOM) of AgCr (7 nm)/MGZO (40 nm) on the glass substrates.

Annealing Temp. (°C)	Rs (ohm sq^{-1})	Tavg. (%) (380-780 nm)	FOM (x10^{-3} ohm^{-1})
–	9.1	88.2	31.3
150	7.8	89.6	42.8
250	7.3	90.2	48.8
350	7.2	89.1	43.8
450	6.9	89.1	45.7

Table S2. The sheet resistance of AgCr/MGZO composite electrodes with different numbers of bending cycles.

Structure	R_S (ohm sq^{-1})								
Bending Cycles	0	100	500	1000	2000	4000	6000	8000	10000
PET/AgCr (7 nm)/ MGZO (30 nm)	16.9	16.8	16.9	17.2	17.3	17.5	17.8	17.9	18.1
PET/AgCr (7 nm)/ MGZO (40 nm)	11.6	11.5	11.5	11.6	11.6	11.7	11.8	11.9	12.0
PET/AgCr (7 nm)/ MGZO (50 nm)	15.1	14.9	15.0	15.2	15.4	15.6	15.7	15.7	15.8

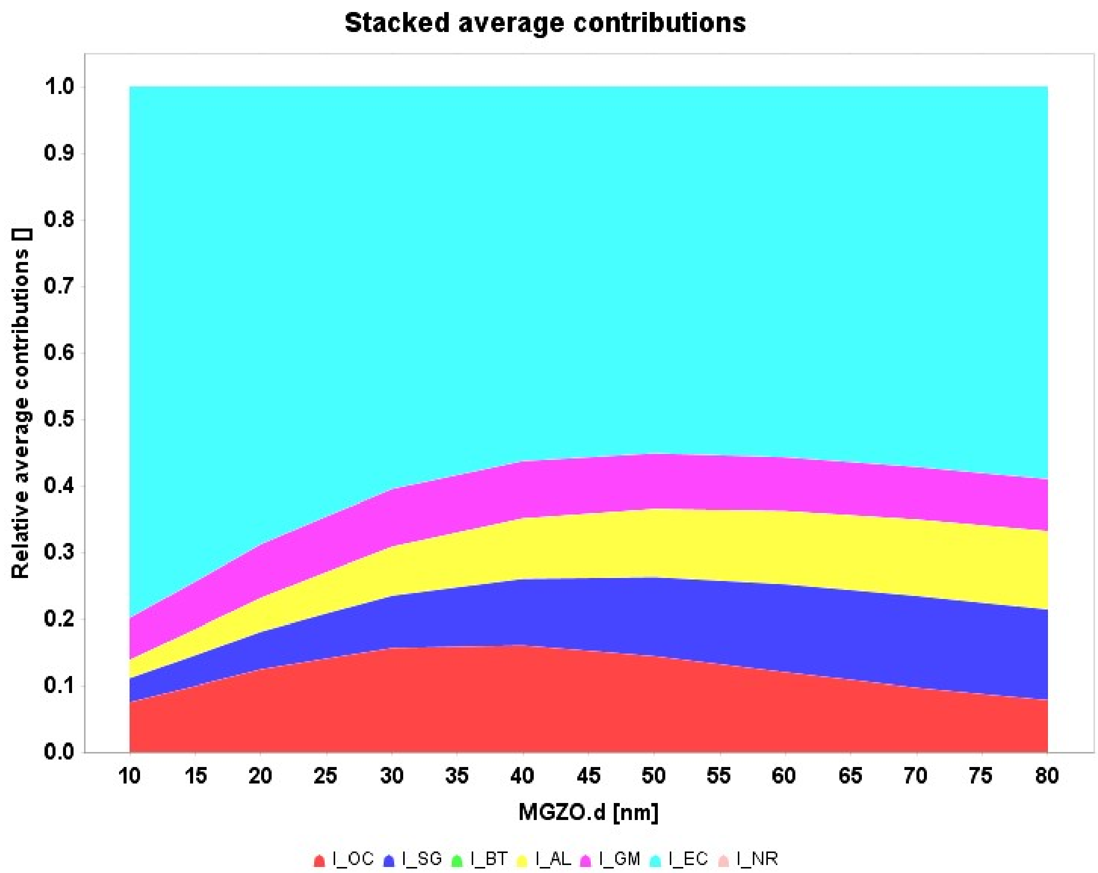

Figure S2. Simulated contribution of each optical mode versus the thickness of MGZO of the composite electrode (glass/AgCr (7 nm)/MGZO) in the green OLEDs.

Table S3. EL characteristics of device B with different numbers of bending cycles.

Bending Cycles		0	100	1000	5000	10000
External Quantum Efficiency (%)	[a]	18.9	18.6	19.9	18.5	18.5
	[b]	18.5	18.0	19.0	18.5	18.3
Luminance Efficiency ($cd\ A^{-1}$)	[a]	67.1	65.5	68.9	64.1	64.3
	[b]	65.7	63.2	65.9	63.8	63.5
Power Efficiency ($lm\ W^{-1}$)	[a]	87.9	84.9	89.1	74.8	75.9
	[b]	69.3	68.9	71.9	69.3	69.2
Turn-on Voltage (V)	[c]	2.4	2.3	2.3	2.3	2.3
CIE 1931 Coordinates (x, y)	[b]	(0.33, 0.61)	(0.34, 0.60)	(0.33, 0.60)	(0.34, 0.60)	(0.34, 0.60)
	[d]	(0.32, 0.61)	(0.34, 0.60)	(0.33, 0.60)	(0.34, 0.60)	(0.34, 0.60)
Maximum Luminance ($cd\ m^{-2}$) [V]		83850 [9.4]	77091 [8.6]	75898 [8.8]	71411 [9.0]	78037 [9.6]

[a] Maximum efficiency. [b] Recorded at 10^2 cd m^{-2}. [c] Turn-on voltage measured at 1 cd m^{-2}. [d] Recorded at 10^3 cd m^{-2}.

Table S4. Comparison of transmittance of metal alloy/TCO films reported in the literature.

Year	Substrate	Metal or metal alloy + TCO	Transmittance (%)	Ref.
2008	Glass	Ag (deposition time: 30 s)/ ZnO (50 nm)	82% @ 550 nm	1
2010	PET	ZrCu (6 nm)/ITO (30 nm)	62.6% @ 550 nm	2
	PET	Ag (6 nm)/ITO (30 nm)	72.2% @ 550 nm	
2010	Glass	AgTi (6 nm)/ZnO (20 nm)	89.5% @ 500 nm	3
2014	Glass	ZrCu (3 nm)/ITO (30 nm)	73% @ 550 nm	4
	Glass	AgMgAl (15 nm)/ITO (30 nm)	70% @ 550 nm	
2019	Glass	$Ag_{66}Zr_{34}$ (10 nm)/ITO (30 nm)	64.0% ($T_{avg.}$:200–1100 nm)	5
2019	Glass	AZO (200 nm)/Ag (16 nm)	< 50% @ 550 nm	6
2023	Glass	AgCr (7 nm)/MGZO (40 nm)	90.1% @ 550 nm	This work
	PET	AgCr (7 nm)/MGZO (40 nm)	90.8% @ 550 nm	

Reference

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