

Supplementary Information

ZnO-Au Hybrid Metamaterials Thin Films with Tunable Optical Properties

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	Film		
	ZnO+10%mol Au	ZnO+20%mol Au	ZnO+30%mol Au
Actual mol% of Au in composite target	9.09% Au	16.7% Au	23.1% Au

Table S1: Table of the actual mol% of Au in the composite ZnO-Au target.

(a)

Z	Element	Family	Atomic Fraction (%)	Atomic Error (%)	Mass Fraction (%)	Mass Error (%)	Fit Error (%)
13	Al	K	17.97	3.42	7.81	0.88	0.62
30	Zn	K	79.29	18.44	83.52	14.55	0.15
79	Au	L	2.73	0.60	8.67	1.37	0.81

(b)

Z	Element	Family	Atomic Fraction (%)	Atomic Error (%)	Mass Fraction (%)	Mass Error (%)	Fit Error (%)
13	Al	K	13.97	2.56	5.57	0.59	0.39
30	Zn	K	80.23	18.20	77.54	13.18	0.19
79	Au	L	5.80	1.25	16.89	2.59	0.21

(c)

Z	Element	Family	Atomic Fraction (%)	Atomic Error (%)	Mass Fraction (%)	Mass Error (%)	Fit Error (%)
13	Al	K	9.75	1.60	3.24	0.29	0.10
30	Zn	K	75.42	15.93	60.78	9.80	0.18
79	Au	L	14.83	2.94	35.98	5.17	0.21

Figure S1: Table showing composition from EDS mapping of the (a) ZnO+10%mol Au, (b) ZnO+20%mol Au, and (c) ZnO+30%mol Au films. This shows the actual amount of Au in the films after deposition.

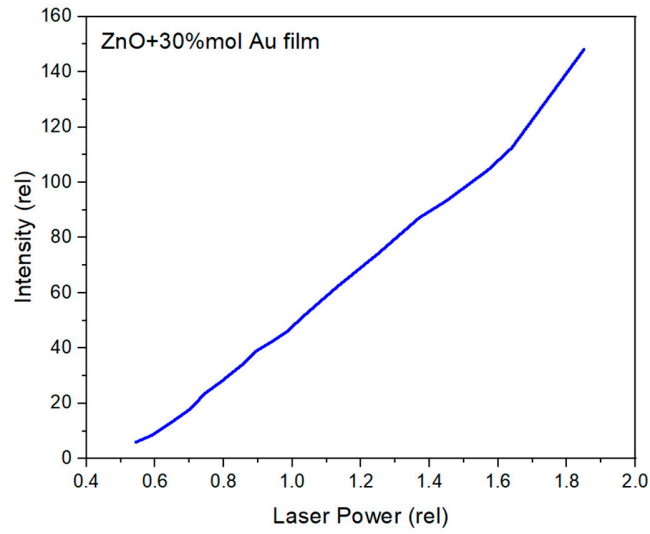


Figure S2: Initial second harmonic generation (SHG) measurements for the ZnO+30%mol Au film. There is no SHG behavior due to a linear relationship between power and intensity.

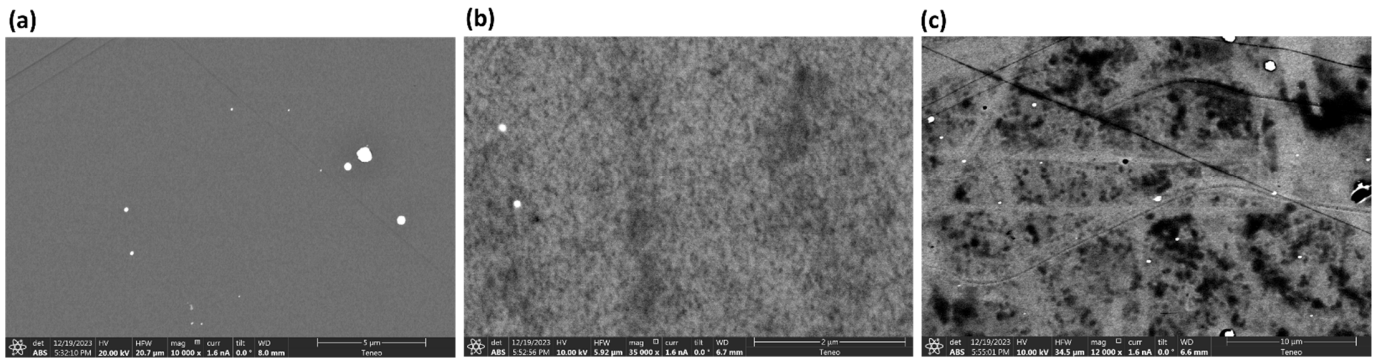


Figure S3: Backscattered electron (BSE) SEM images of the (a) 10% Au, (b) 20% Au, and (c) 30% Au samples. The bright contrast spots are the Au while the gray contrast area is the ZnO.