Electronic Supplementary Information

Deposition Time-Driven Growth of Gold Nanoparticles for Enhanced Performance in Ethanol Electrooxidation

Setia Budi[1,*], Annisa Auliya[1], Hilman Syafei[2]

[1]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Negeri Jakarta, Jl. Rawamangun Muka, Jakarta 13220, Indonesia.

[2]The Center for Science Innovation, Jakarta 13120, Indonesia

*Corresponding author: setiabudi@unj.ac.id (Setia Budi)

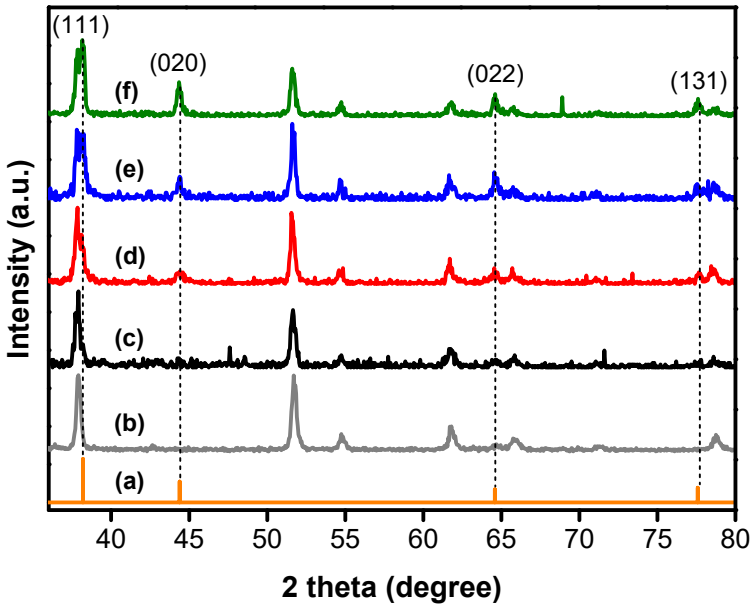

Fig. S1 Full XRD patterns of (b) FTO-coated glass substrate, the AUNPs electrodeposited with deposition duration of of 1 (c), 5 (d), 10 (e), and 50 minutes (f), and the corresponding COD database pattern No. 96-900-8464 (a).

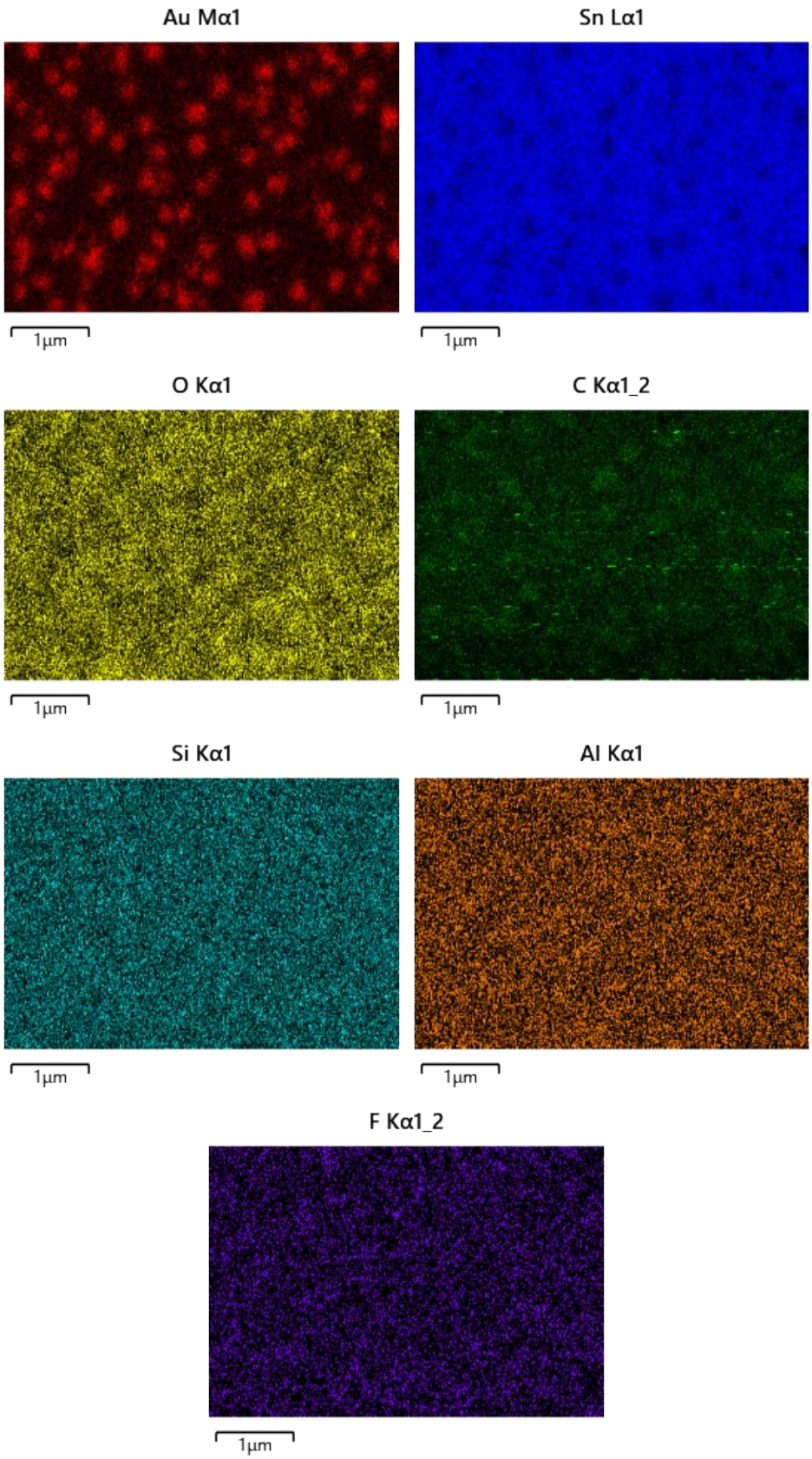

Fig. S2 EDX elemental mapping showing the distribution of gold and other elements present in the FTO-coated glass substrate.

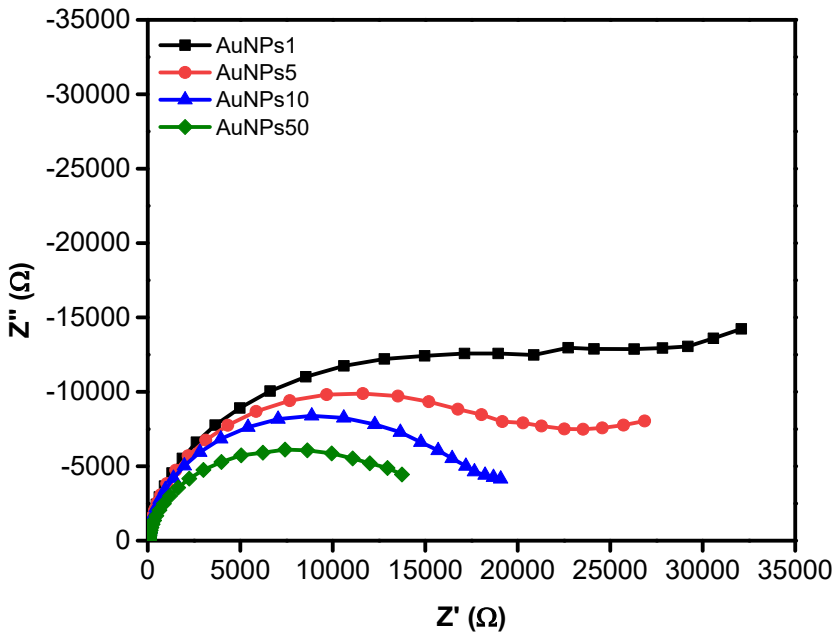

Fig. S3 Full Nyquist plot measured in the frequency range from 0.01 Hz to 100 kHz.

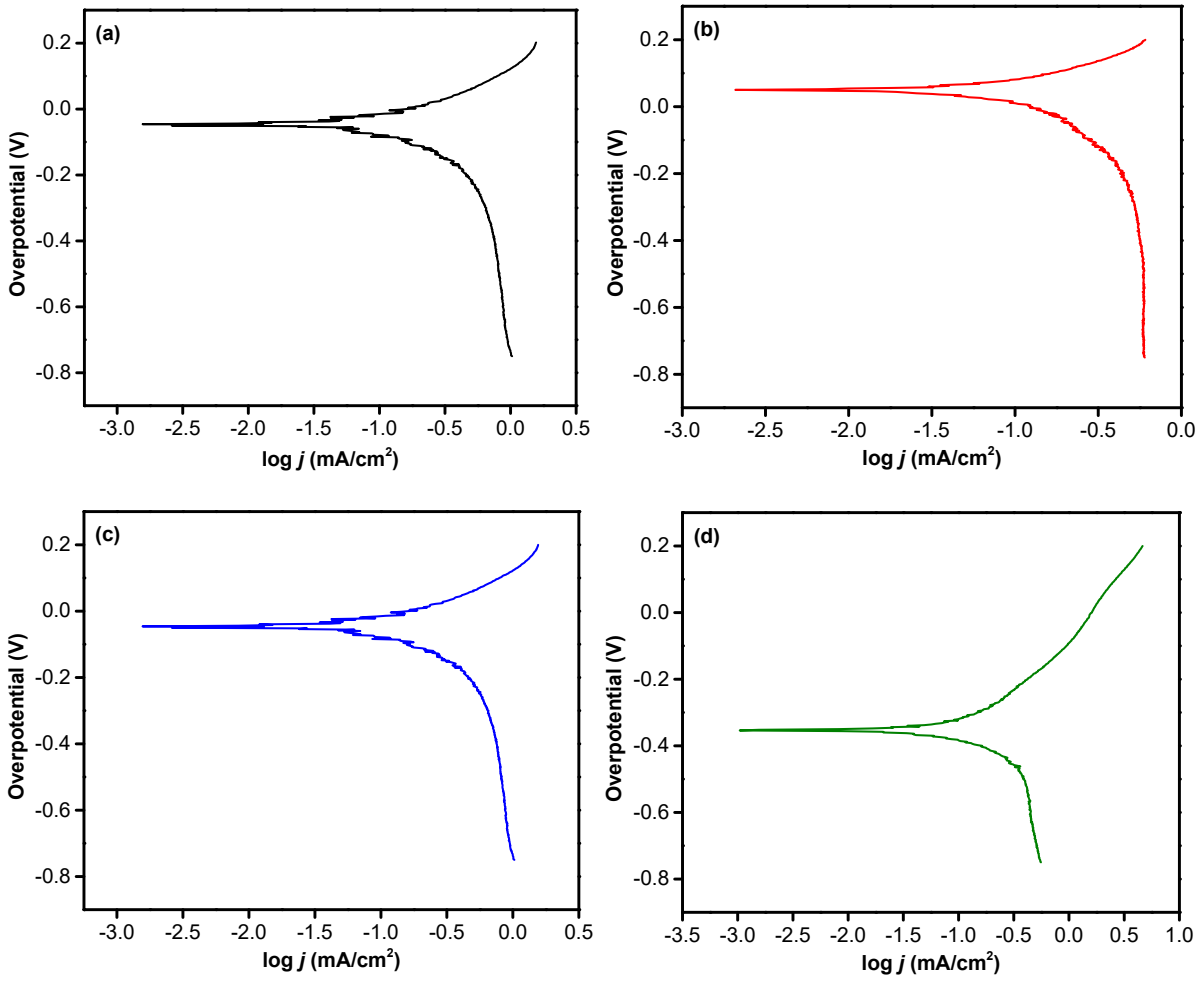

Fig. S4 Tafel plot of the AuNPs1 (a), AuNPs5 (b), AuNPs10 (c), and AuNPs50 (d).

Table S1 Particle sizes of the electrodeposited AuNPs measured using ImageJ software form the FESEM micrographs.

AuNPs1	AuNPs5	AuNPs10	AuNPs50
32.193	140.945	25.874	47.159
60.645	102.254	30.046	56.632
53.163	138.315	36.056	54.822
94.749	87.733	57.009	53.221
81.34	94.192	59.743	69.239
83.094	83.443	42.492	62.195
108.336	85.862	56.026	70.506
	73.82	50.028	73.313
	71.344	74.012	96.006
	58.046	66.057	87.699
	44.175	67.686	99.774
	51.387	77.631	82.157
	46.909	70.416	80.491
	35.687	61.192	93.573
		98.098	86.399
		92.451	91.37
		81.104	81.585
		93.427	84.679
		82.074	110.843
		81.713	102.849
		108.577	120
		112.805	110.479
		107.497	123.86
		124.108	135.701
		121.026	122.365
		138.343	134.768
		134.99	131.423
		151.621	122.895
			120.606
			162.858
			149.313
			189.859
			195.893
			220.077
			253.008
			215.014

Table S3 Charge transfer resistance (R_{ct}) and solution resistance (R_s) determined from the measured Nyquist plots using CS studio 5 and Zview software.

Sample	R_{ct} (Ω)	R_s (Ω)
AuNPs1	25.99	28.64
AuNPs5	21.38	42.79
AuNPs10	17.69	52.10
AuNPs50	15.31	25.53