Supplementary Information of

Electrodeposition of a Sn-Ru alloys by using Direct, Pulsed and Pulsed Reverse current for decorative applications

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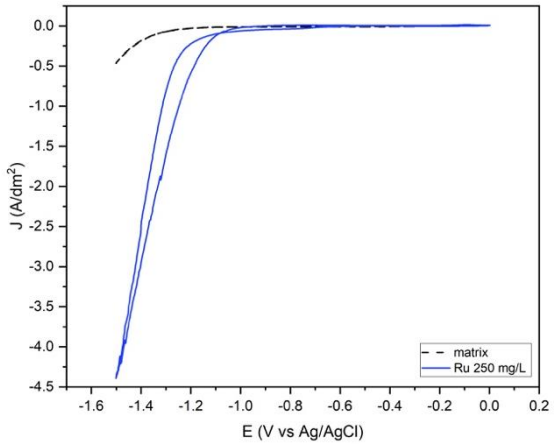


Figure S1. Cyclic Voltammetries of the galvanic bath containing all the components except Sn with a GC RDE as WE. From 0 V to -1,5 V to 0 V. Matrix: SC 30 g/L, ST 120 g/L, KOH 1 g/L, pH: 13.5. Ru 250 mg/L: matrix with Ru, pH 9, 50 °C, 10 mV/s.

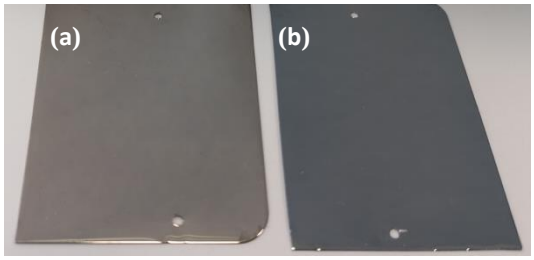


Figure S2. Color difference between the samples DC 1 A/dm^2 (a) and PRC 10 ms (b).

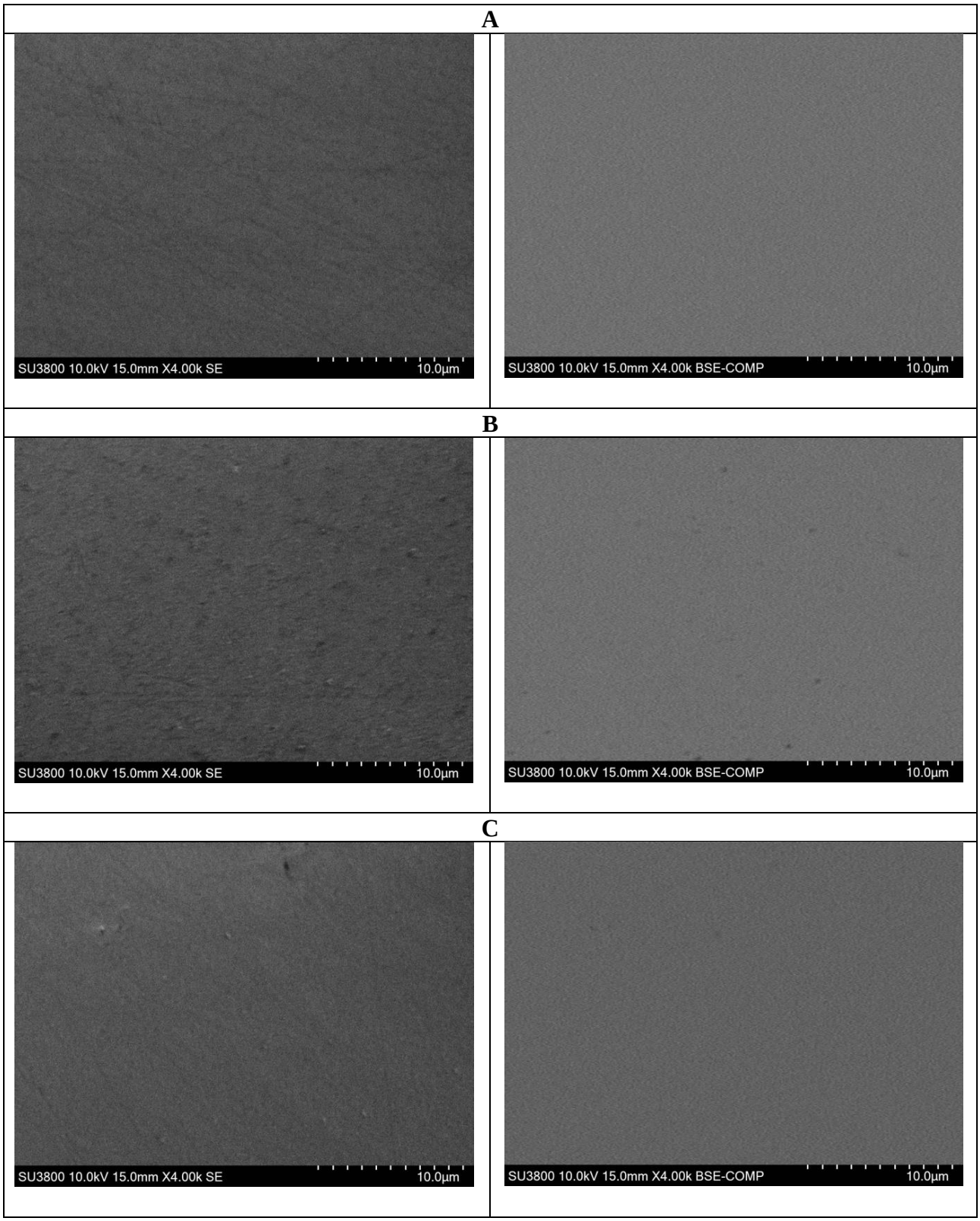


Figure S3. SE and BSE images. (A) DC 1 A/dm^2 (B) PC with t = 2 ms (C) PRC with t_C = 2 ms.

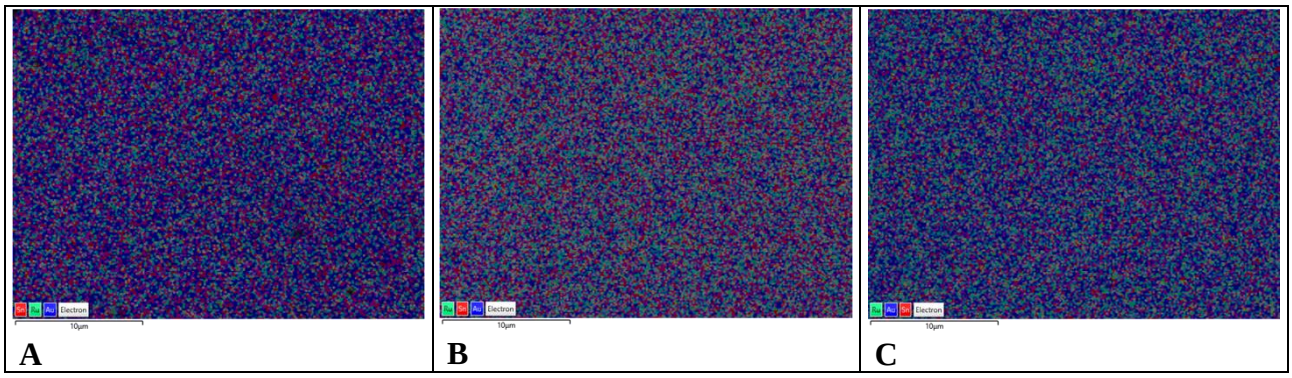


Figure S4. EDS Maps of samples in Figure S3 showing the elementary distribution of the two most superficial layers: Au(blue) and Sn-Ru (red-green). (A) DC 1 A/dm² (B) PC with t = 2 ms (C) PRC with t_C = 2 ms. The Maps were acquired with an acceleration voltage of 5 kV to limit the contribution of the underlying layers.

Table S1. Average value of thicknesses and compositions measured with XRF

Sample	Thickness (nm)	SD	Sn (At %)	SD
DC	106	12	81.0	1
PC 2 ms	128	6.5	82.0	2
PC 5 ms	107	19.5	77.4	0.5
PC 10 ms	131	8	77.4	0.7
PRC 2 ms	142	2.5	76.0	2
PRC 5 ms	152	22	75.0	1
PRC 10 ms	166	7.5	74.5	0.8

Table S1. Average thicknesses and compositions measured on the samples shown in Figure 6. SD: standard deviations on the five measurements.