

SUPPORTING INFORMATION

Electroforming in metal-oxide memristive synapses

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Table S1. Description of the parameters used during the deposition of the dielectric film for each sample.

Device structure	Dielectric parameters
Ti/TiO ₂ /Au	30 min sputtering at 70 W
Au/TiO ₂ /Au	150 °C ALD for 30, 90, 120 cycles
	30 min sputtering at 150 W
Ni/TiO ₂ /Au	30 min sputtering at 70 W
Ni/Al ₂ O ₃ /Au	60 cycles ALD at 200 °C
Ti/Al ₂ O ₃ /Au	
Au/Al ₂ O ₃ /Au	
Ni/Al ₂ O ₃ /Pt	
Ni/HfO ₂ /Au	66 cycles ALD at 250 °C

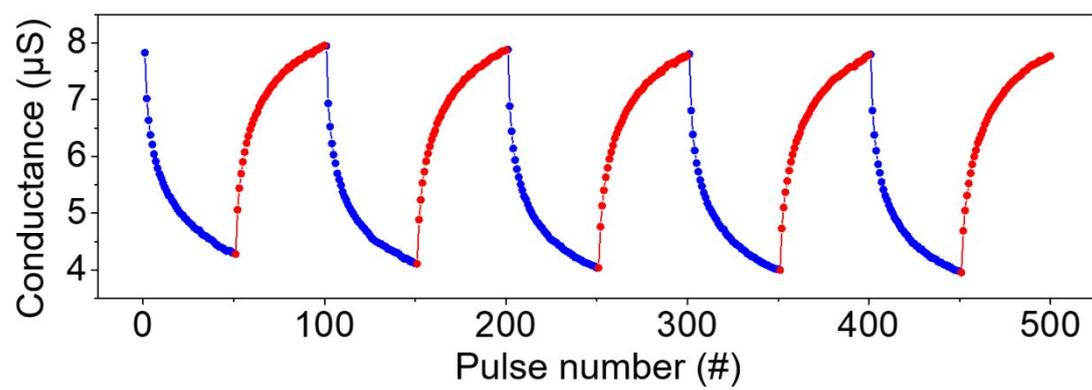


Figure S1. Standard potentiation and depression in the CIC-like cells (Ti/TiO₂/Au).

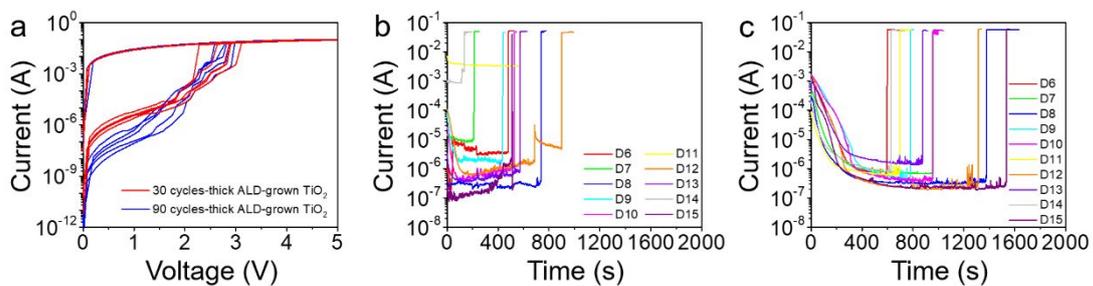


Figure S2. Electroforming in thinner ALD-grown TiO_2 based devices. (a) RVS-induced electroforming of Au/30 cycles-thick ALD-grown TiO_2 /Au and Au/90 cycles-thick ALD-grown TiO_2 /Au. (b) and (c) CVS-induced electroforming in Au/30 ALD cycles TiO_2 /Au and Au/90 ALD cycles TiO_2 /Au under 2.2 V (respectively).

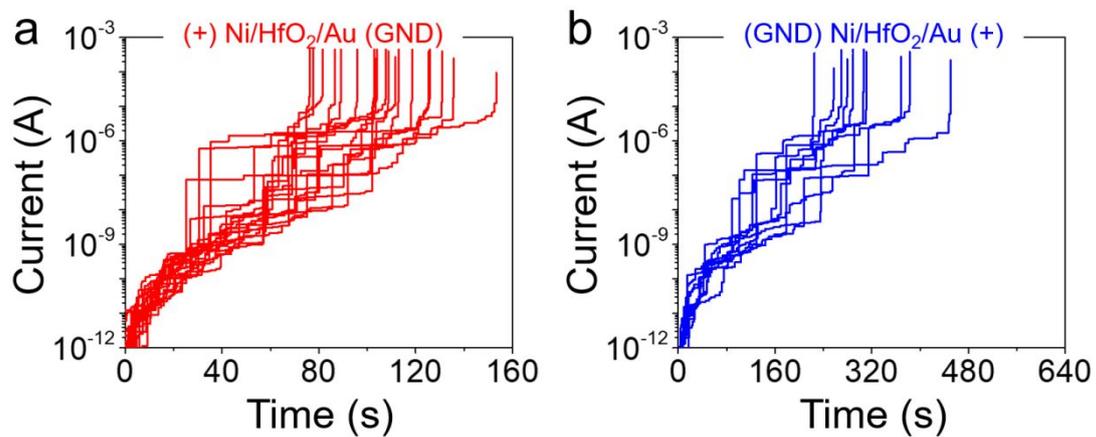


Figure S3. CVS-induced electroforming simulated via Ginstra™ software in Ni/HfO₂/Au with 4.5 V applied on Ni (a) and Au (b) electrodes respectively.

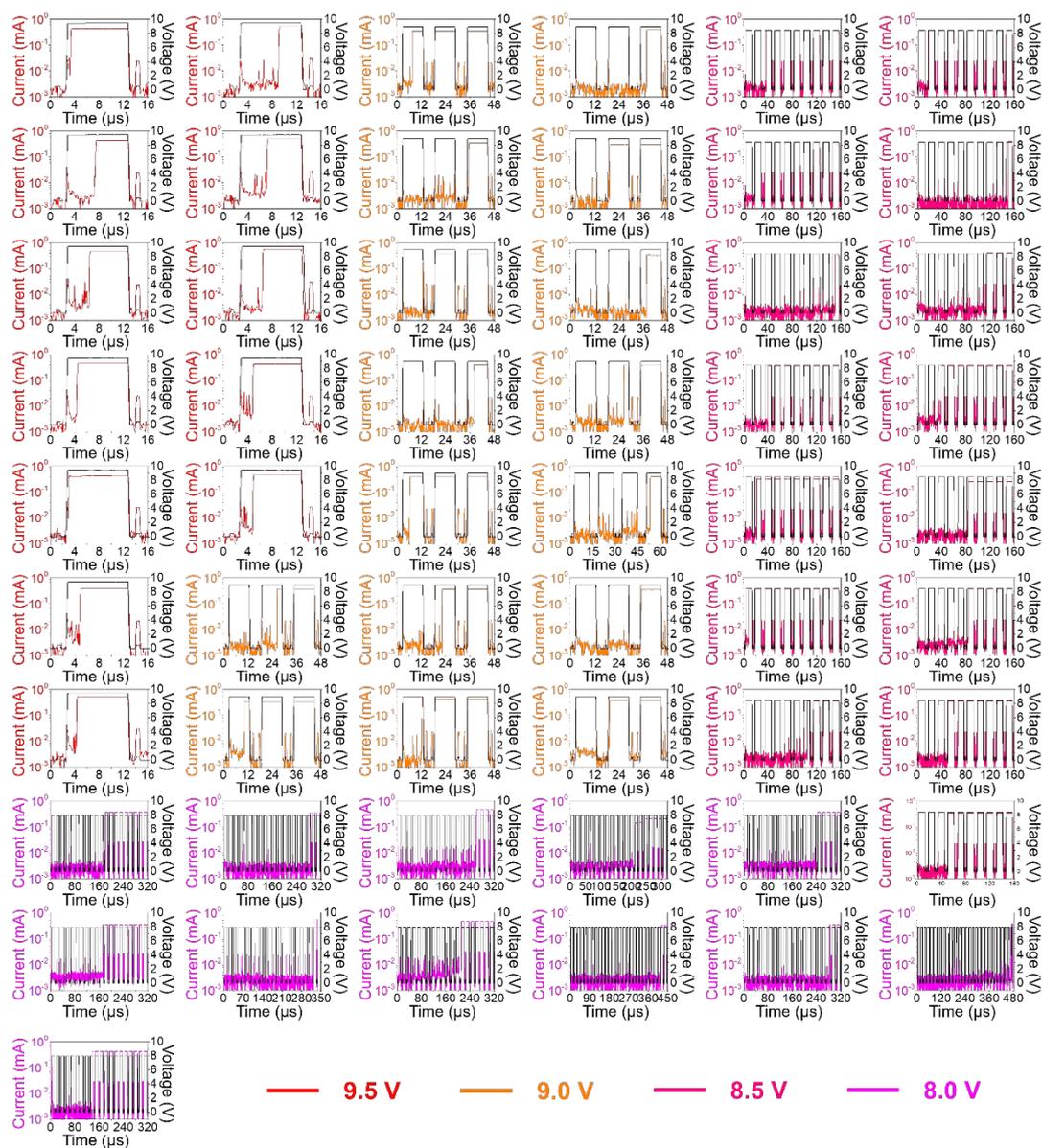


Figure S4. PVS-induced electroforming in 55 devices with (+) Ni/HfO₂/Au (GND).

When the bias is applied at the top Ni electrode, the current increases sharply for more than two orders of magnitudes.

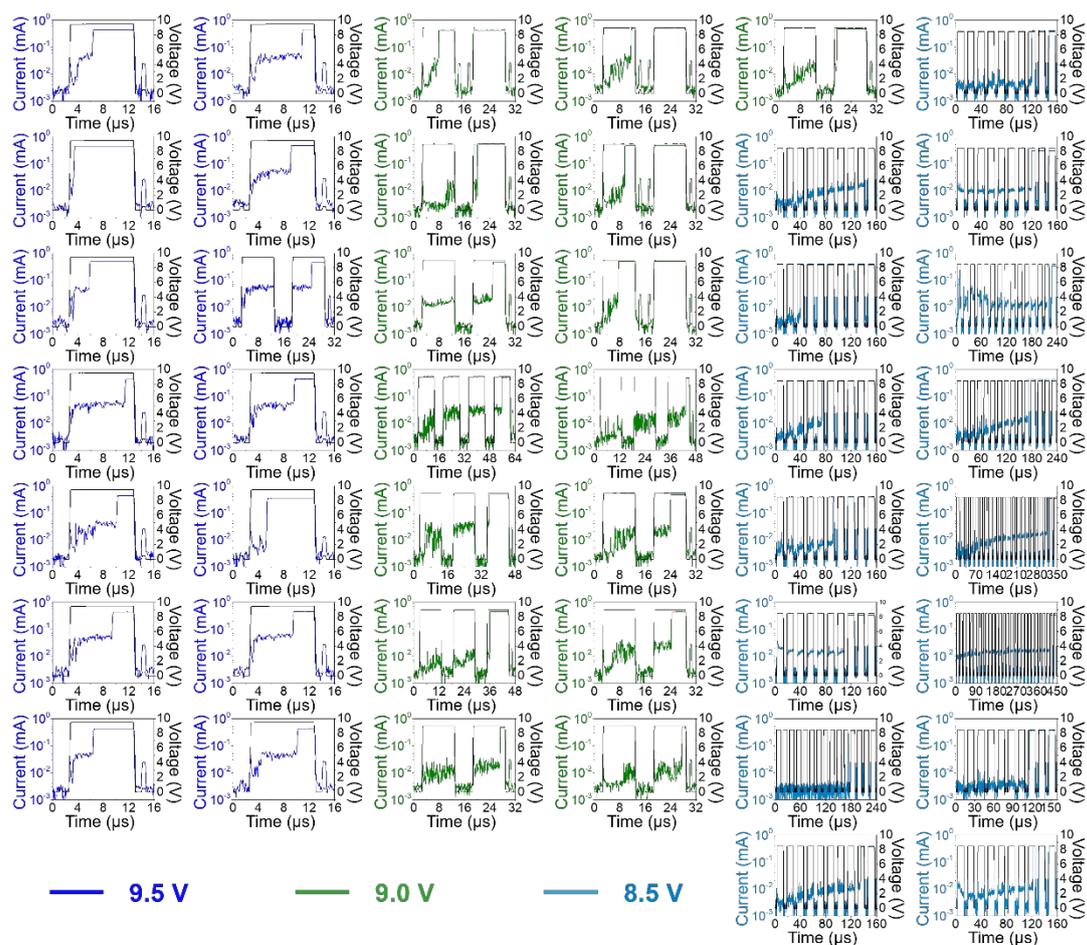


Figure S5. PVS-induced electroforming in 44 devices with (GND) Ni/HfO₂/Au (+). When the bias is applied at the bottom Au electrode, the current increases progressively, and the final current jump is around one order of magnitude.