

Resistance switching in Ag, Au and Cu films at the percolation threshold

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A straightforward method for thin metal films production and bringing them at the percolation threshold has been developed. The method is based on the controlled thermal annealing of initially conductive metal films. Electrical conductivity studies of thin silver, gold, and copper films at the percolation threshold revealed the existence of high-resistance states ($10^{12} \Omega$) and low-resistance states ($10^3 \Omega$) of the films. The switching between these states under bias is reversible. The characteristic switching times are 200 ns, $2 \mu\text{s}$, and $60 \mu\text{s}$ for silver, gold, and copper films, correspondently.

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