

Fig. 1. 200 Cycles of Co(DAD)₂ + TBA at 180°C on a Patterned Cu/SiO₂ structure. The Cu stripes are gray and the SiO₂ areas are black. (left) After 200 cycles on the unpassivated sample, unwanted Co nuclei are observed close to the Co/Cu stripes. (right) On a passivated sample, the density of unwanted nuclei is 4x lower and more uniform across SiO₂.

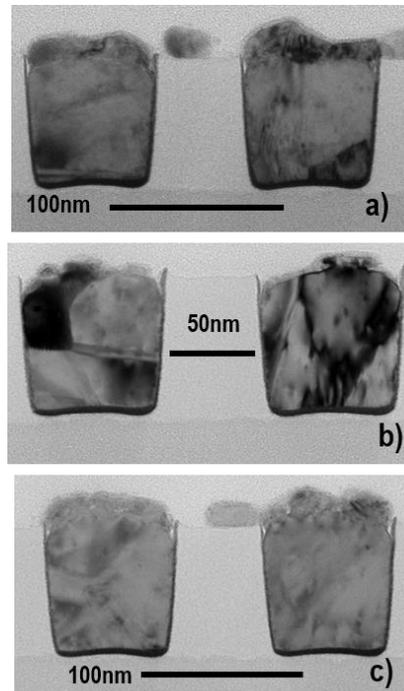


Fig. 2. TEM of 200 Co ALD cycles with varying purge time and dose. The Cu stripes are dark grey and the SiO₂ areas are white. (a) With 8 pulses of Co precursor per cycle, and 5s purge time, unwanted nucleation density is high. (b) Reducing Co pulse count to 2 pulses/cycle lowers the growth rate. (c) Increasing the purge time from 5s to 20s improves unwanted nucleation density, but higher precursor does not eliminate unwanted nucleation.

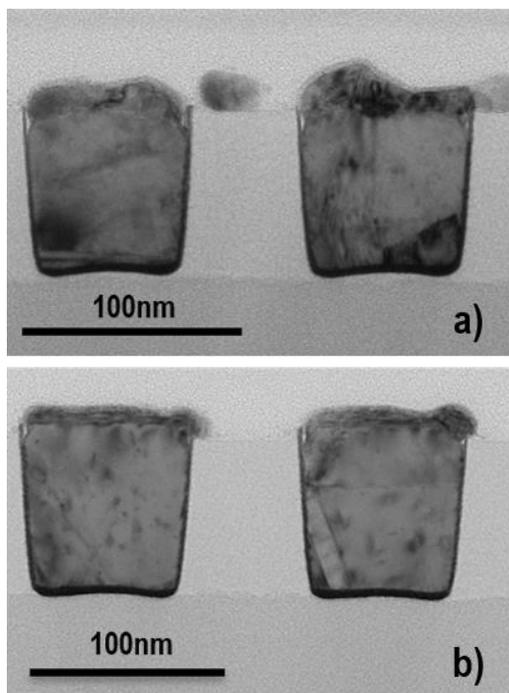


Fig. 3. TEM of 200 Co ALD cycles with and without Periodic Annealing. The Cu stripes are dark grey and the SiO₂ areas are white. (a) Without periodic anneal, unwanted nucleation is observed on SiO₂. (b) After periodic anneals every 100 cycles, a denser film is observed, with formation at edge consistent with nanoscale reflow of Co.

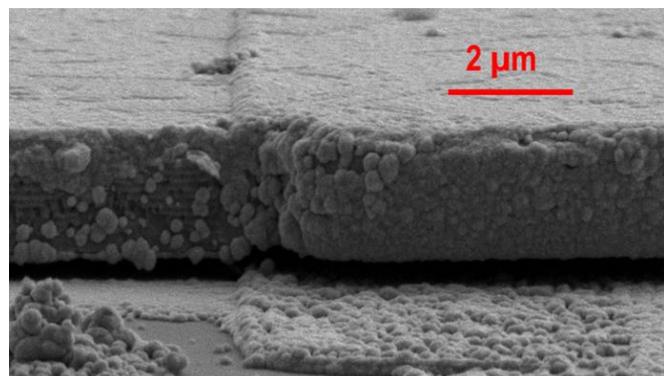


Fig. 4. SEM of 1000 cycles Co ALD on Suspended Cu Stripes. After 1000 cycles, unwanted nucleation was observed in proximity to Cu patterns, while electrical contact was observed between suspended structures.