

Supplementary information

Enhancing Selectivity in Area-Selective Atomic Layer Deposition of Al₂O₃ on Cu Using N₂ co-Flow

Sangjun Lee^{†,1}, Changyu Park^{†,1}, Yong-Woo Choi[‡], Seong Woo Jeong[‡], Sung-Wook Hong[‡], Yunhee Cho[§], Hana Lee[§], Hyeji Kim[§], Andreas Klipp^{||}, Pil J. Yoo^{‡,¶,††}, and Hyoungsub Kim^{†,¶,*}

*Hyoungsub Kim

School of Advanced Materials Science and Engineering
Sungkyunkwan University
School of Semiconductor Convergence Engineering
Sungkyunkwan University
Suwon 16419, Republic of Korea
Tel.: +82-31-290-7363
Fax: +82-31-290-7371
hsubkim@skku.edu

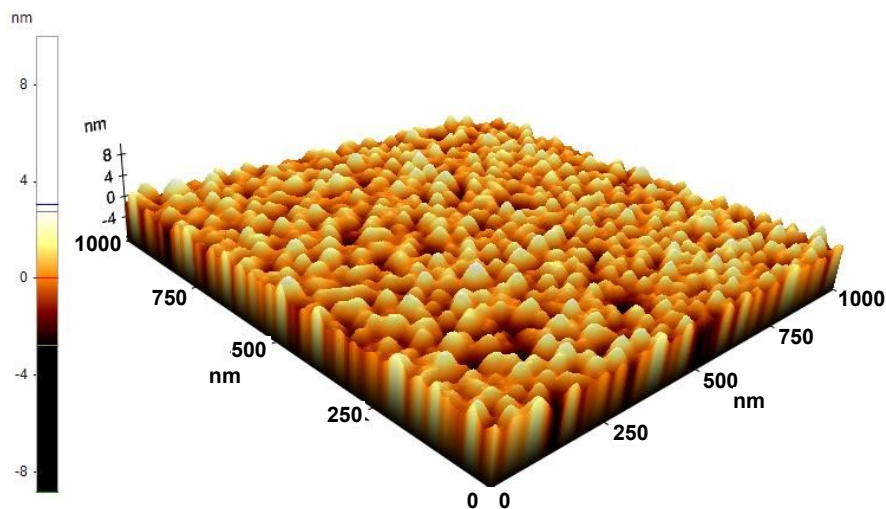


Fig. S1 AFM image measured on a cleaned Cu substrate.

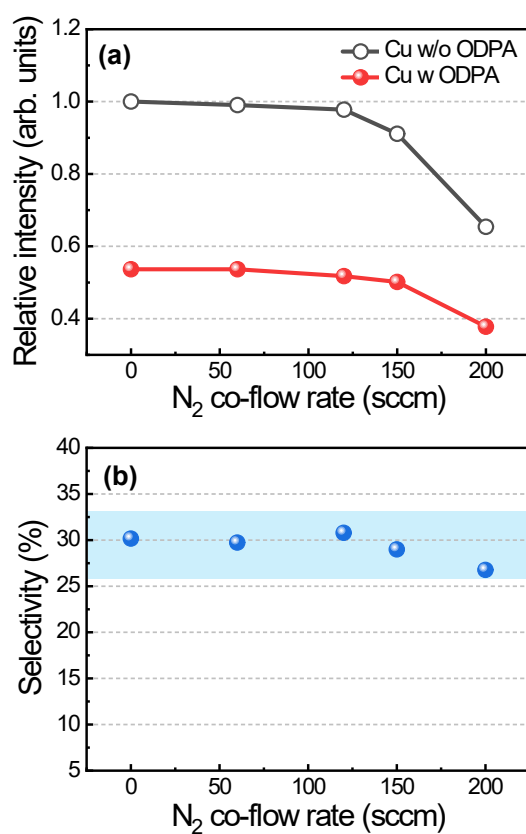


Fig. S2 (a) Relative Al_2O_3 XRF intensity and (b) corresponding selectivity as a function of N_2 co-flow rate when Al_2O_3 films were deposited on Cu surfaces with and without ODPA coatings, using a fixed number of ALD cycles (28 cycles).

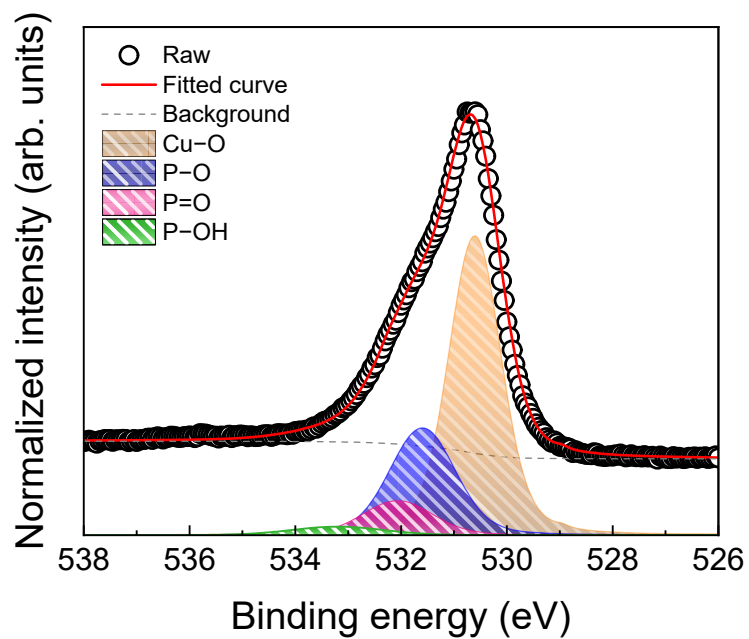


Fig. S3 Deconvoluted XPS O 1s spectrum of a DDPA-coated Cu substrate prior to TMA exposure.

Table S1 Summary of peak fitting parameters used for the deconvolution of the O 1s XPS spectrum shown in Fig. S3.

Parameter	Bonding state			
	Cu-O	P-O	P=O	P-OH
Binding energy (eV)	530.5±0.1	531.7±0.1	532.1±0.1	533.3±0.1
Gaussian width (eV)	1	1.3	1.4	1.9

Table S2 Summary of peak fitting parameters used for the deconvolution of the O 1s XPS spectra shown in Fig. 7(a-d).

Parameter	Bonding state		
	Cu-O	P-O	Al-O
Binding energy (eV)	530.5±0.1	531.7±0.1	532.3±0.1
Gaussian width (eV)	1.2	1.3	1.85