Electronic Supplementary Material (ESI) for Nanoscale.

Supporting information for

Design nanoporous metal thin films via solid state interfacial dealloying

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Video S1. 3D XRF nano-tomography of 460C-30 sample

Video S2. 3D STEM-EDX nano-tomography of 460C-30 sample.

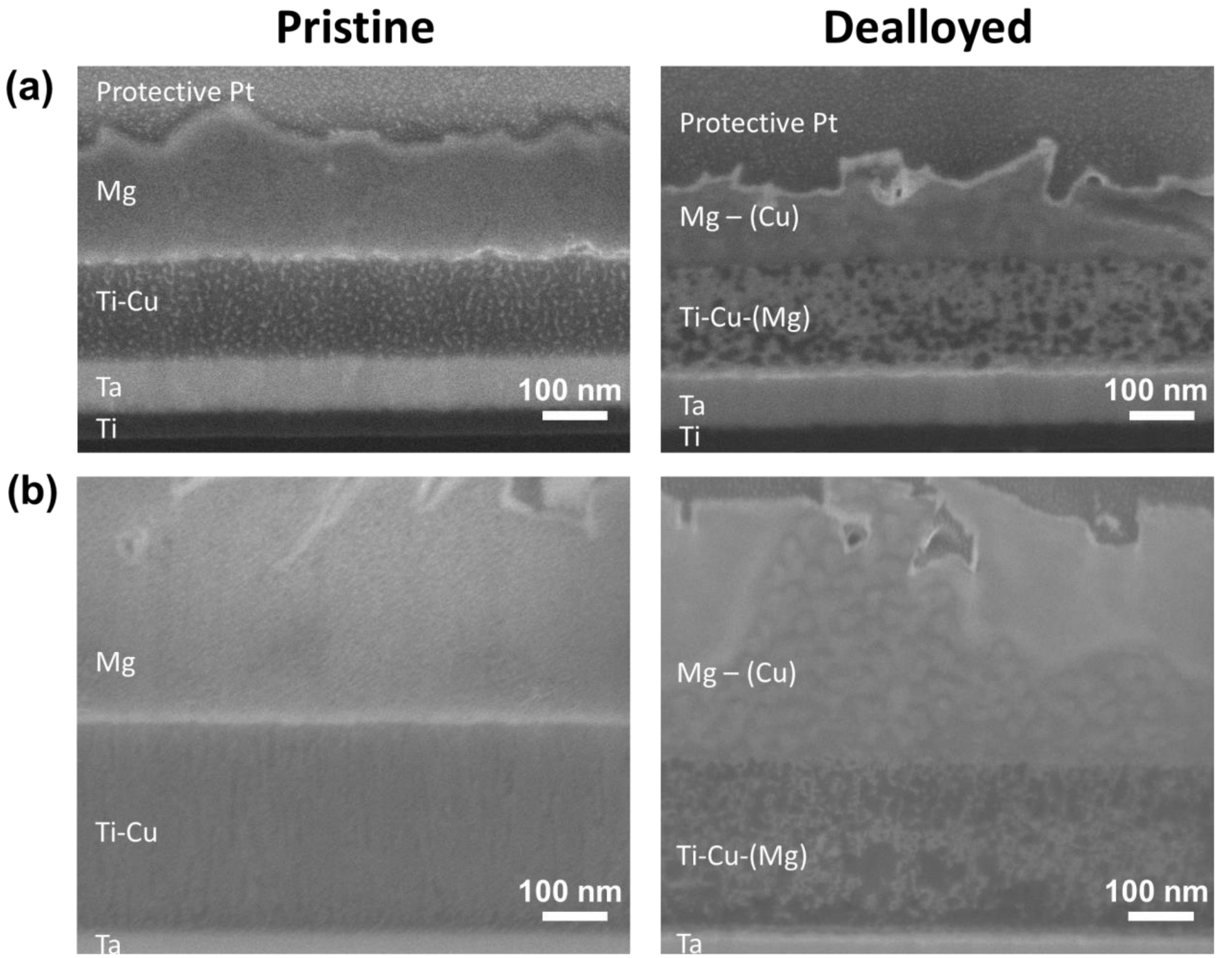

Figure S1. SEM cross-section view of $Ti_{30}Cu_{70}$ at.% films dealloyed by Mg at 460°C for 30 min, with (a) a silicon wafer as the substrate: (left) the pristine Ti-Cu film, and (right) the dealloyed Ti-Cu film, and (b) a borosilicate glass as the substrate: (left) the pristine Ti-Cu film, and (right) the dealloyed Ti-Cu film.

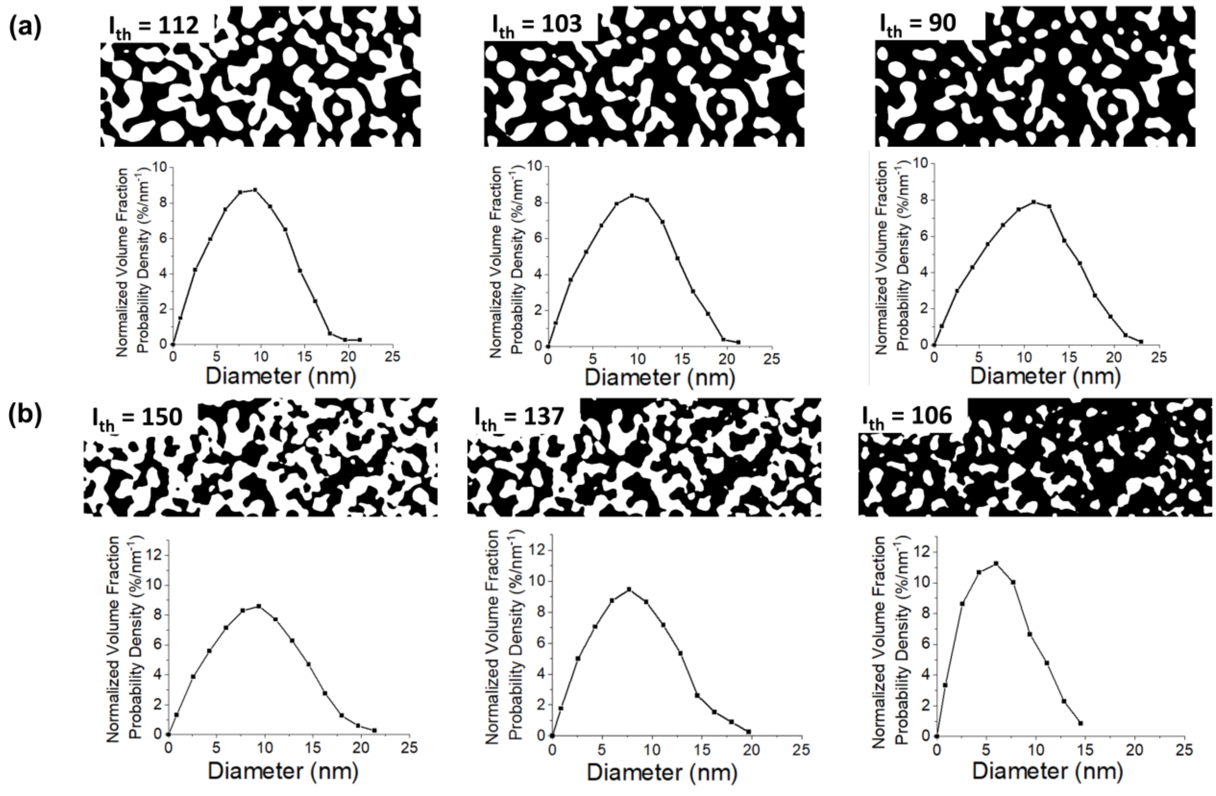

Figure S2. Segmented images of Ti EDX mapping of (a) 460C-30 and (b) 460C-30-E with different threshold values (I_{th}) and their corresponding ligament size distribution

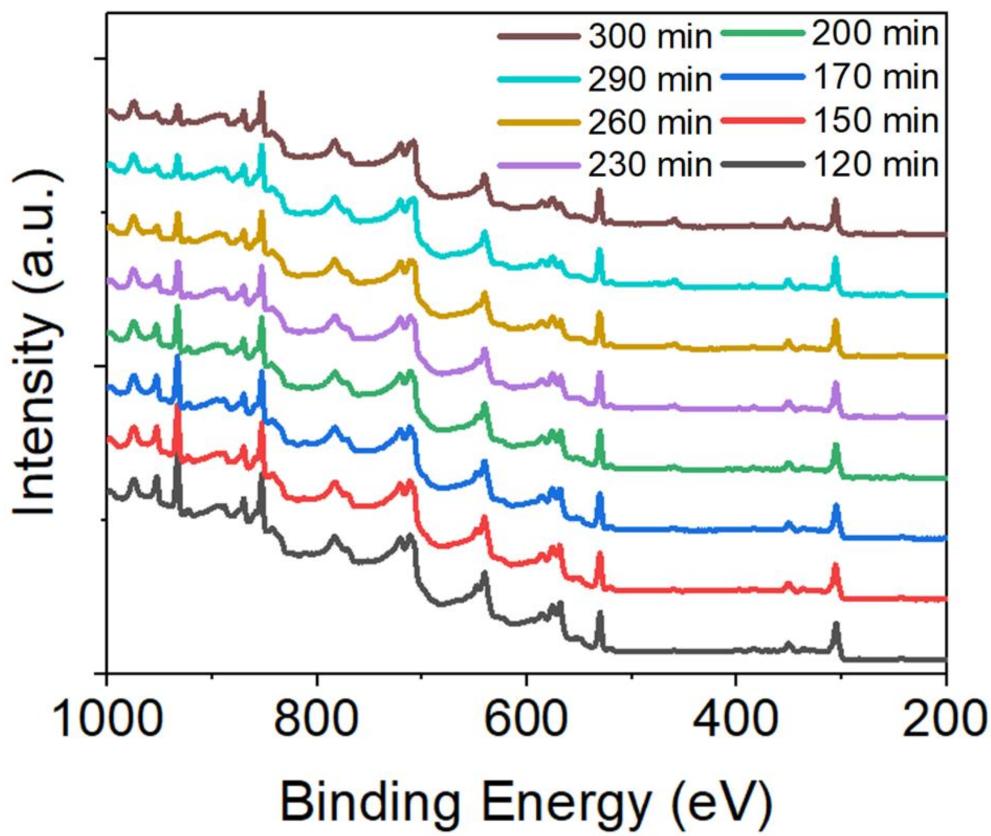

Figure S3. XPS analysis on 460C-30 sample after sputtering by Ar^+ at 1.5 keV at different times.

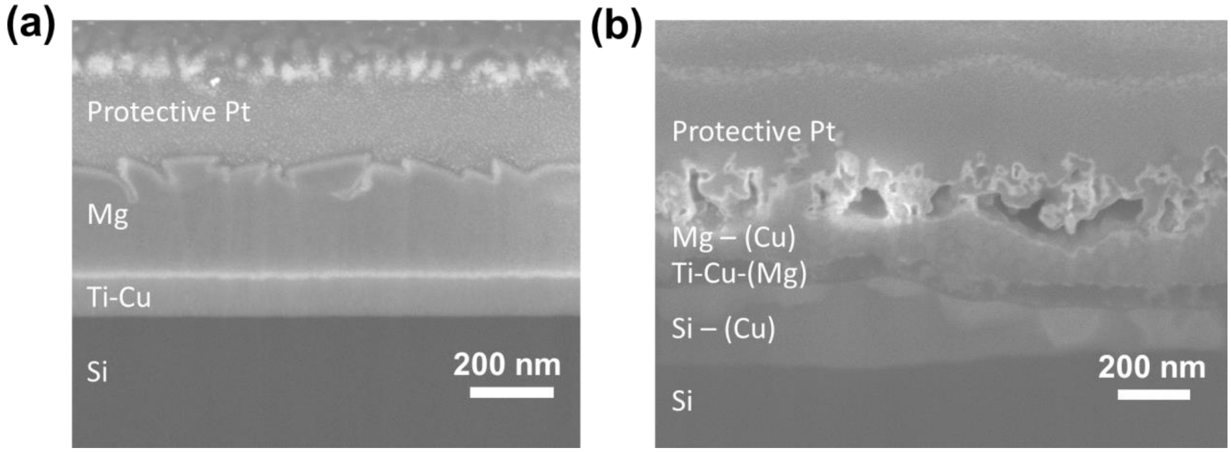

Figure S4. SEM cross-section view of $Ti_{30}Cu_{70}$ at.% films dealloyed by Mg at 460°C for 30 min, without the Ta barrier layer. A silicon wafer was used as a substrate: (a) the pristine Ti-Cu film, and (b) the dealloyed Ti-Cu film.

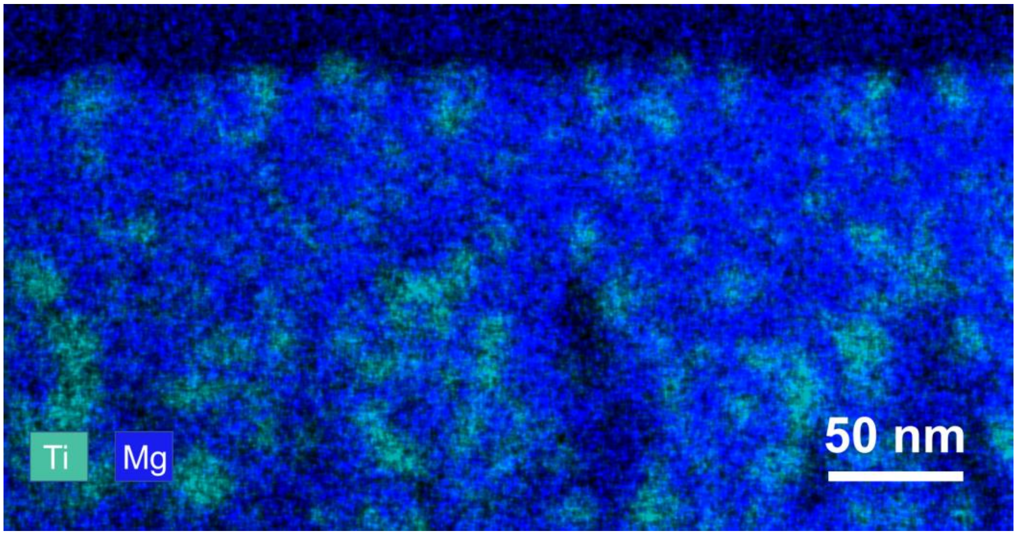

Figure S5. Overlap of Ti and Mg EDX maps from the 460C-30 sample.

Table S1. Summary of atomic radius ratio differences in previously reported SSID systems.

Systems	Atomic radius of each element	Largest atomic radius ratio in the system	Atomic radius ratio between the soluble and the solvent element (dealloying agent)
(Ta-Ti)-Zr[1]	Ta: 1.430 Ti: 1.462 Zr: 1.603	Ti/Zr = 1.462/1.603 = 0.912	Ti/Zr = 1.462/1.603 = 0.912
(Ta-Ti)-Cu	Ta: 1.430 Ti: 1.462 Cu: 1.278	Cu/Ti = 1.278/1.462 = 0.874	Cu/Ti = 1.278/1.462 = 0.874
(Fe-Ni)-Cu[1]	Fe: 1.241 Ni: 1.246 Cu: 1.278	Cu/Fe = 1.241/1.278 = 0.971	Cu/Ni = 1.246/1.278 = 0.975
(Ti-Cu)-Mg	Ti: 1.462 Cu:1.278 Mg: 1.601	Cu/Mg = 1.278/1.601 = 0.798	Cu/Mg = 1.278/1.601 = 0.798
(Ti-Mo-Cu)-Mg[2]	Ti: 1.462 Cu:1.278 Mo: 1.363 Mg: 1.601	Cu/Mg = 1.278/1.601 = 0.798	Cu/Mg = 1.278/1.601 = 0.798
(Fe-Ni)-Mg[3]	Fe: 1.241 Ni: 1.246 Mg: 1.601	Fe/Mg = 1.241/1.601 = 0.775	Ni/Mg = 1.249/1.601 = 0.780
(Fe-Cr-Ni)-Mg[4]	Fe: 1.241 Ni: 1.246 Cr: 1.249 Mg: 1.601	Fe/Mg = 1.241/1.601 = 0.775	Ni/Mg = 1.249/1.601 = 0.780

References

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