

# Evolution of 3D nanoporosity and morphology in selectively dealloying ternary $\text{Au}_{55}\text{Cu}_{25}\text{Si}_{20}$ metallic glass ribbon with enhanced alcohol electro-oxidation performance

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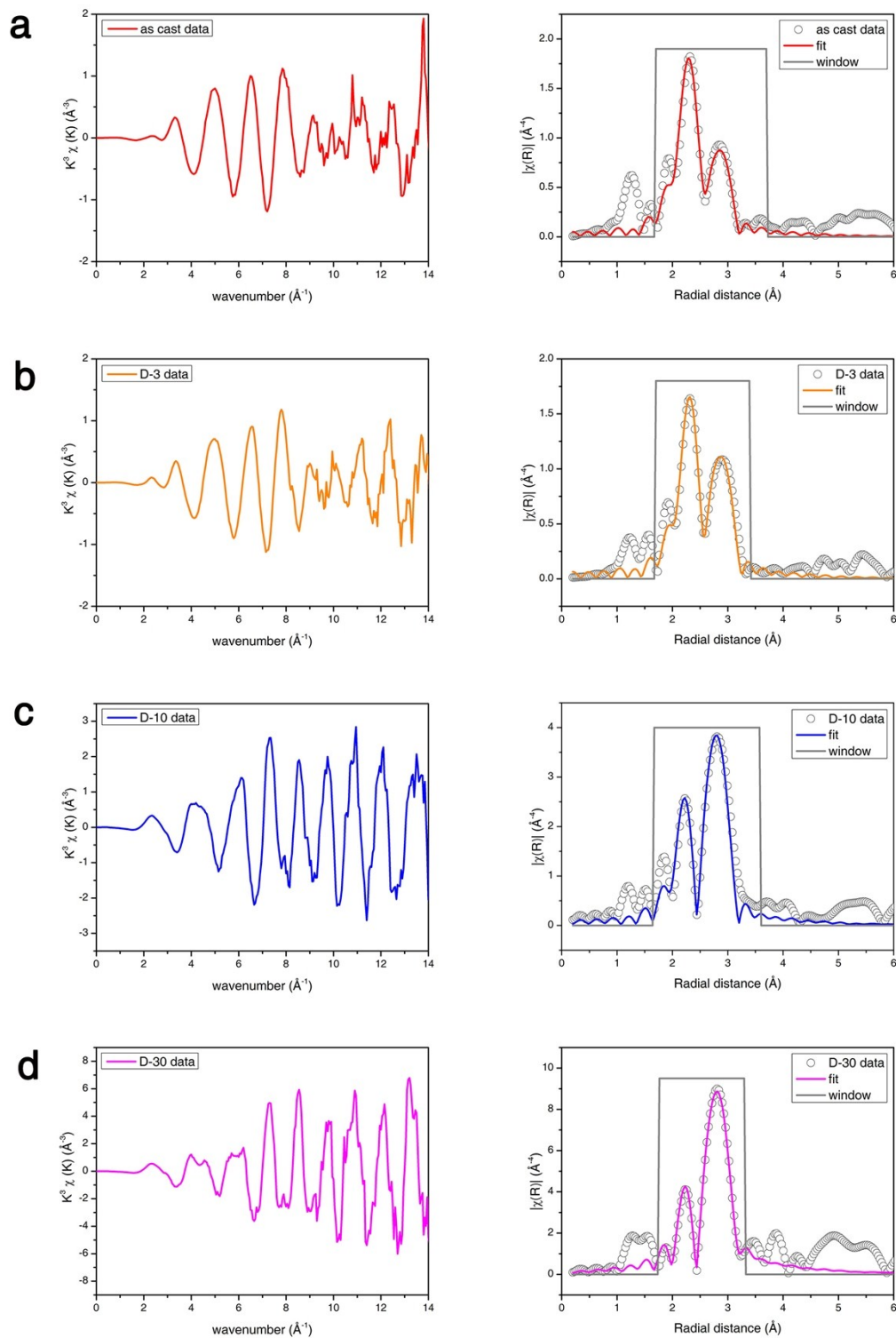
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**Figure S1** EXAFS analysis results for as cast sample, D-3, D-10 and D-30 products.

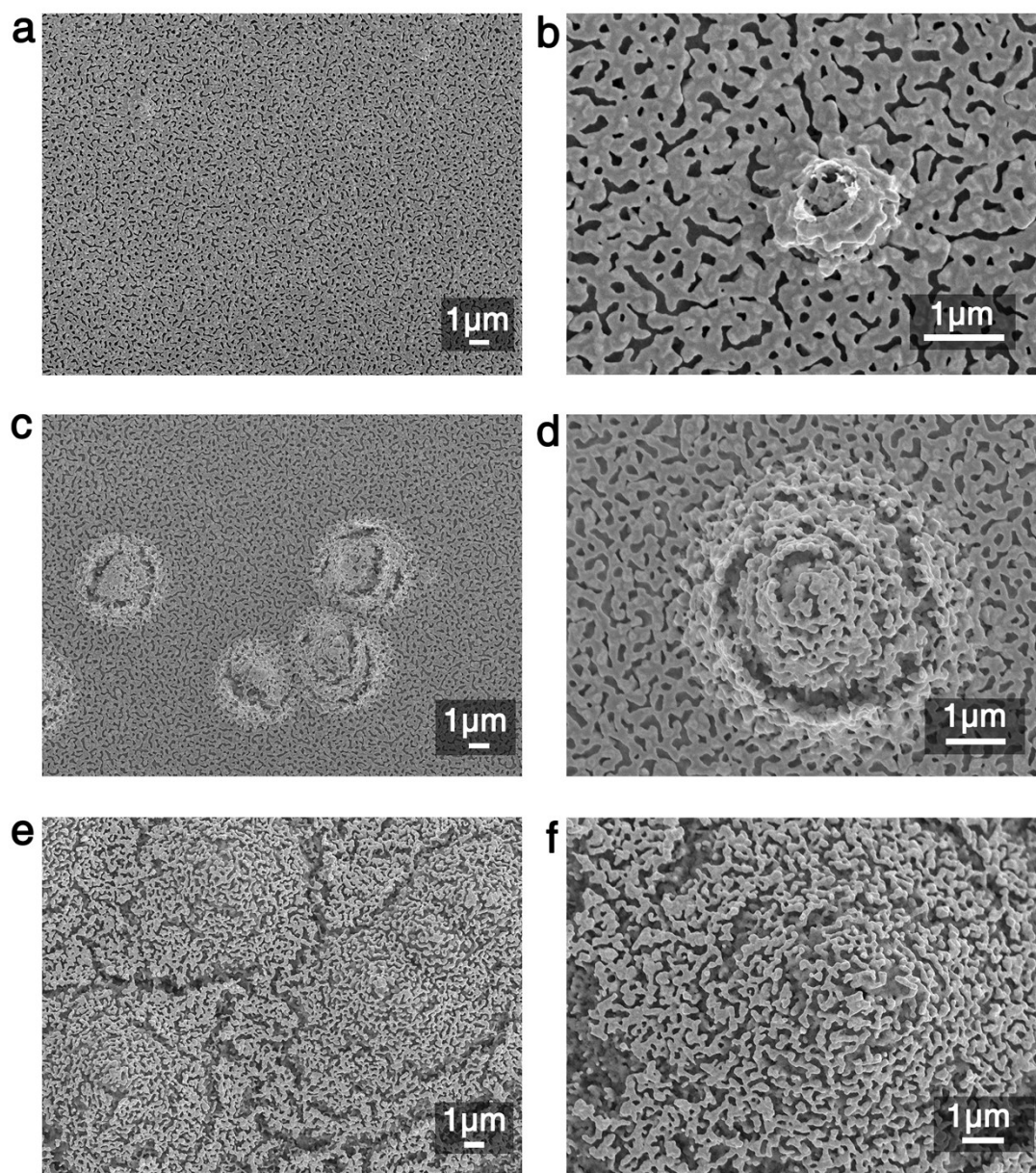
**Figure S2** Structural characterization of samples de-alloyed with different dealloying temperature.

**Figure S3** TEM image from gold nanoparticle area.

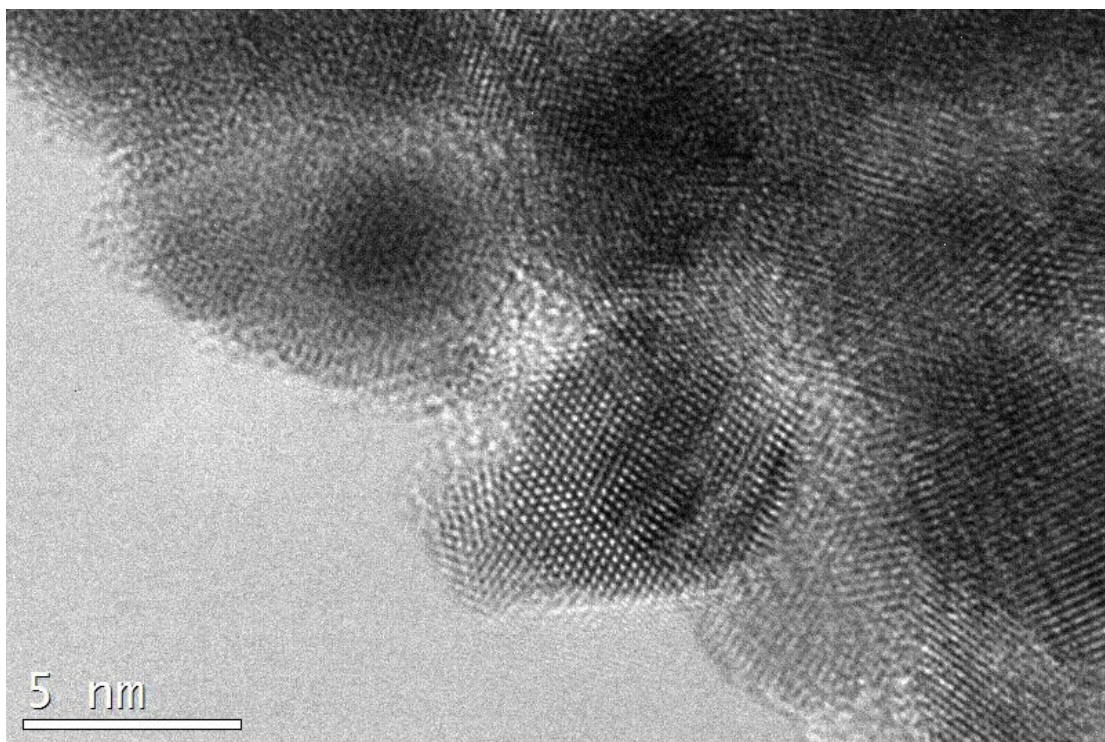
**Table S1** for EXAFS fitting parameters.



**Figure S1** EXAFS analysis results for as cast sample, D-3, D-10 and D-30 products.  $k^3$ -weighted  $\chi(k)$  EXAFS spectra for Au  $L_3$ -edge (left column) EXAFS spectra and fits to the EXAFS Fourier transforms into R space (right column). The  $\Delta R$  fitting windows are indicated on the plots.



**Figure S2** Structural characterization of samples de-alloyed with different dealloying temperature. SEM images of samples de-alloyed at (a,b) 60°C; (c,d) 70°C; and 90°C(e,f) after de-alloying 30 mins.



**Figure S3** TEM image from gold nanoparticle area.

**Table S1 for EXAFS fitting parameters.**

	CN	R (Å)	$\sigma^2$ (Å <sup>2</sup> )
As cast			
Au-Au	12	2.77(2)	0.010(7)
Au-Si	2	2.51(2)	0.002(9)
D-3			
Au-Au	12	2.80(1)	0.009(6)
Au-Si	2	2.52(4)	0.003(1)
D-10			
Au-Au	12	2.74(1)	0.009(0)
Au-Si	2	2.45(3)	0.002(5)
D-30			
Au-Au	12	2.74(8)	0.006(1)
Au-Si	2	2.47(8)	0.003(1)

The fitting parameters obtained from the analysis of the EXAFS spectra of for as cast, D-3, D-10, and D-30 samples. CN is the coordination number, R is the interatomic distance,  $\sigma^2$  is the Debye-Waller factor, uncertainties are given in brackets.

**Reference:**

1. Gaigher, H. L., & Van der Berg, N. G. The structure of gold silicide in thin Au/Si films. *Thin Solid Films*, **68(2)**, 373-379 (1980).
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3. Heald, S. M., & Tan, Z. Interfacial reaction in a-Si/Au and a-Si/Cu thin film bilayers. *Japanese Journal of Applied Physics*, **32(S2)**, 386 (1993).