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Supporting Information

for

Combining physical vapor deposition structuration with dealloying for the creation of a highly efficient SERS platform

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Additional figures

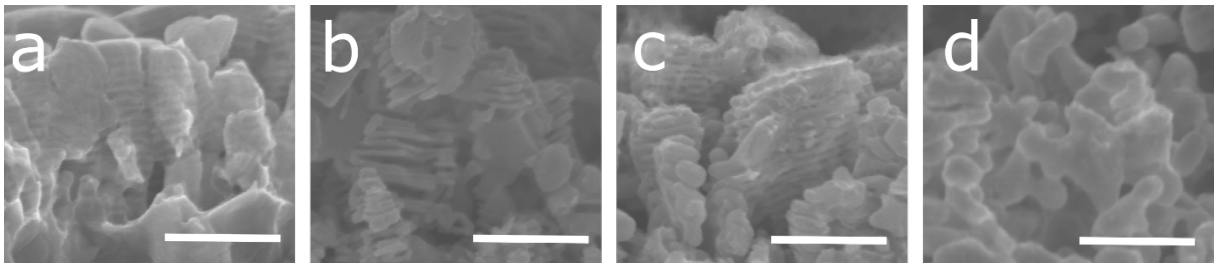

Figure S1: High magnification of cross-section SEM images of the (a) initial Ag–Al thin film with 30 atom % of Ag and dealloyed for (b) 10, (c) 30, and (d) 60 min. Scale bar: 250 nm. The high magnification of the cross sections highlights the nanolayer morphological structure and behavior throughout the dealloying process.

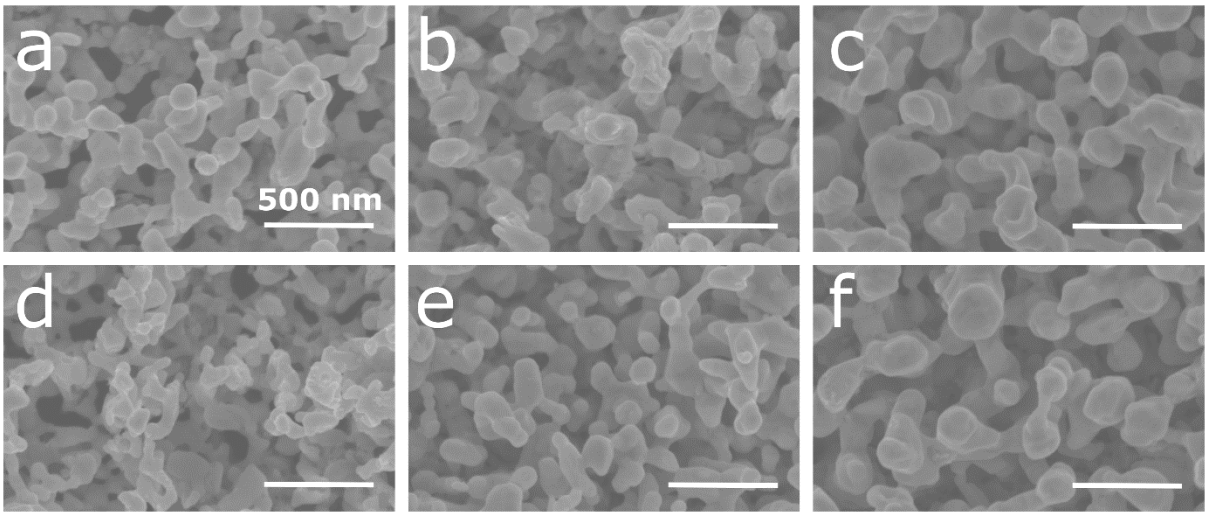

Figure S2: Plan view SEM images of Ag–Al thin films dealloyed for 120 min in (a–c) HCl and (d–f) H_3PO_4 for a sample with an initial composition of (a and d) 18, (b and e) 30, and (c and f) 36 atom % of Ag. Scale bar: 500 nm. Depending on the initial silver content, the morphology after dealloying for 120 min in HCl and H_3PO_4 does not change. The ligament size increases when the initial silver content is increased.

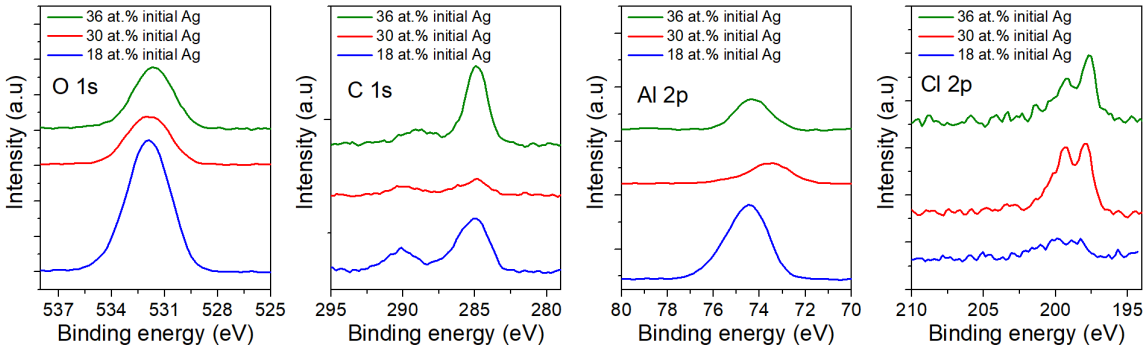

Figure S3: XPS (O 1s, C 1s, Al 2p, and Cl 2p) spectra recorded on a Ag–Al alloy thin film dealloyed for 60 min in an HCl solution (1 wt %) with an initial composition of 18, 30, and 36 atom % of Ag.

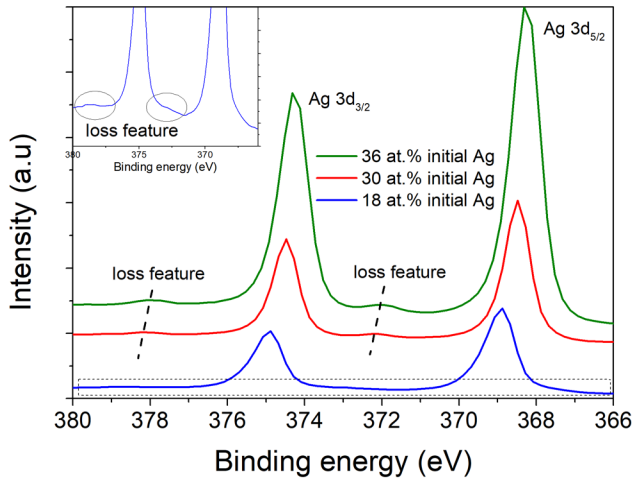

Figure S4: XPS Ag 3d recorded on a Ag–Al alloy thin film dealloyed for 60 min in an HCl solution (1 wt %) with an initial composition of 18, 30, and 36 atom % of Ag. The inset is a zoom of the dotted area corresponding to the sample with 18 atom % of initial Ag. All samples after dealloying for 60 min highlight the loss feature characteristic of metallic silver.

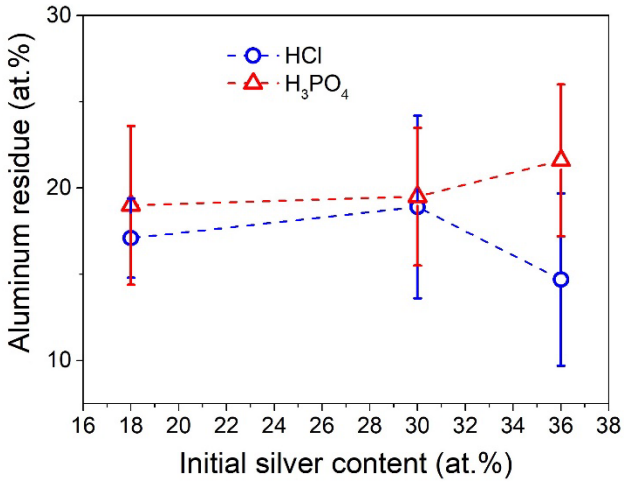

Figure S5: Aluminum residue probed by EDX of the Ag–Al alloy thin film dealloyed for 120 min in a H_3PO_4 solution (10 wt %) and in an HCl solution (1 wt %) with an initial composition of 18, 30, and 36 atom % of Ag.

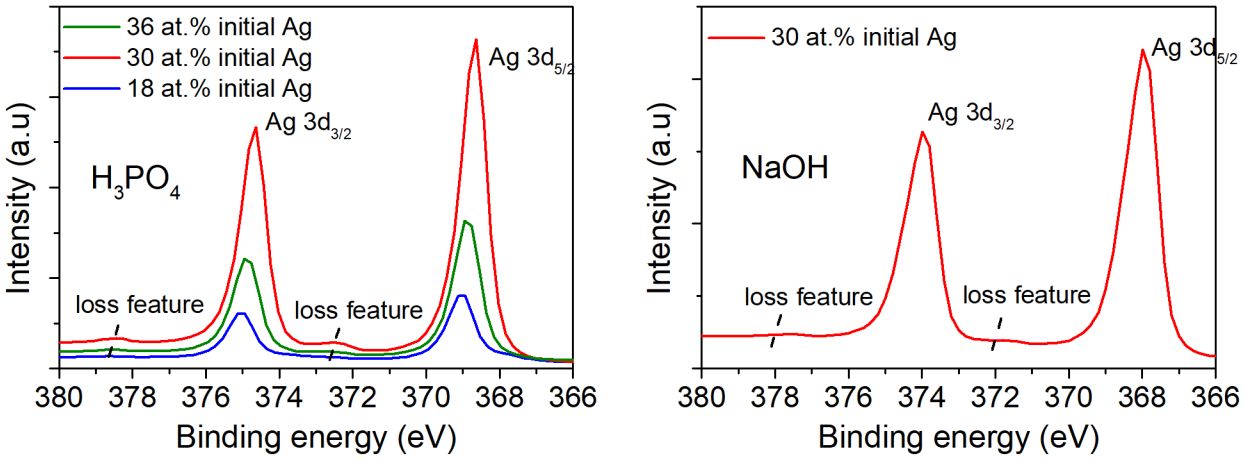

Figure S6: XPS analysis of the Ag 3d peak of the Ag/Al alloy thin film dealloyed during 60 min in (left) H_3PO_4 solution at 10 wt % with an initial composition of 18, 30, and 36 atom % of Ag and in (right) a NaOH solution at 30 wt % with an initial composition of 30 atom % of Ag.

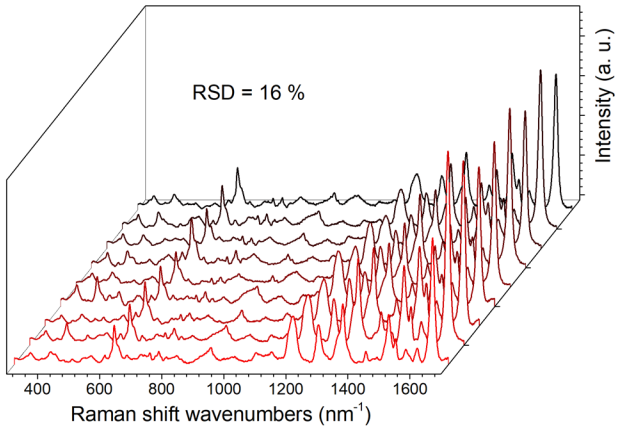

Figure S7: Raman spectra of RhB diluted at 10^{-7} mol·L^{-1} and recorded in nine different places over the nanoporous silver surface made by dealloying an Ag–Al alloy film with 30 atom % of Ag at the initial state and dealloyed for 60 min in a HCl solution at 1 wt %. Following these analyses, the relative standard deviation (RSD) for the intensity value of the peak at 1648 cm^{-1} was evaluated to be 16%.