**Electronic supplementary information (ESI):**

# Electrochemical dealloying of $Al_2(Au,X)$ (X=Pt, Pd, PtPd, Ni, Co and NiCo) alloys in NaCl aqueous solution

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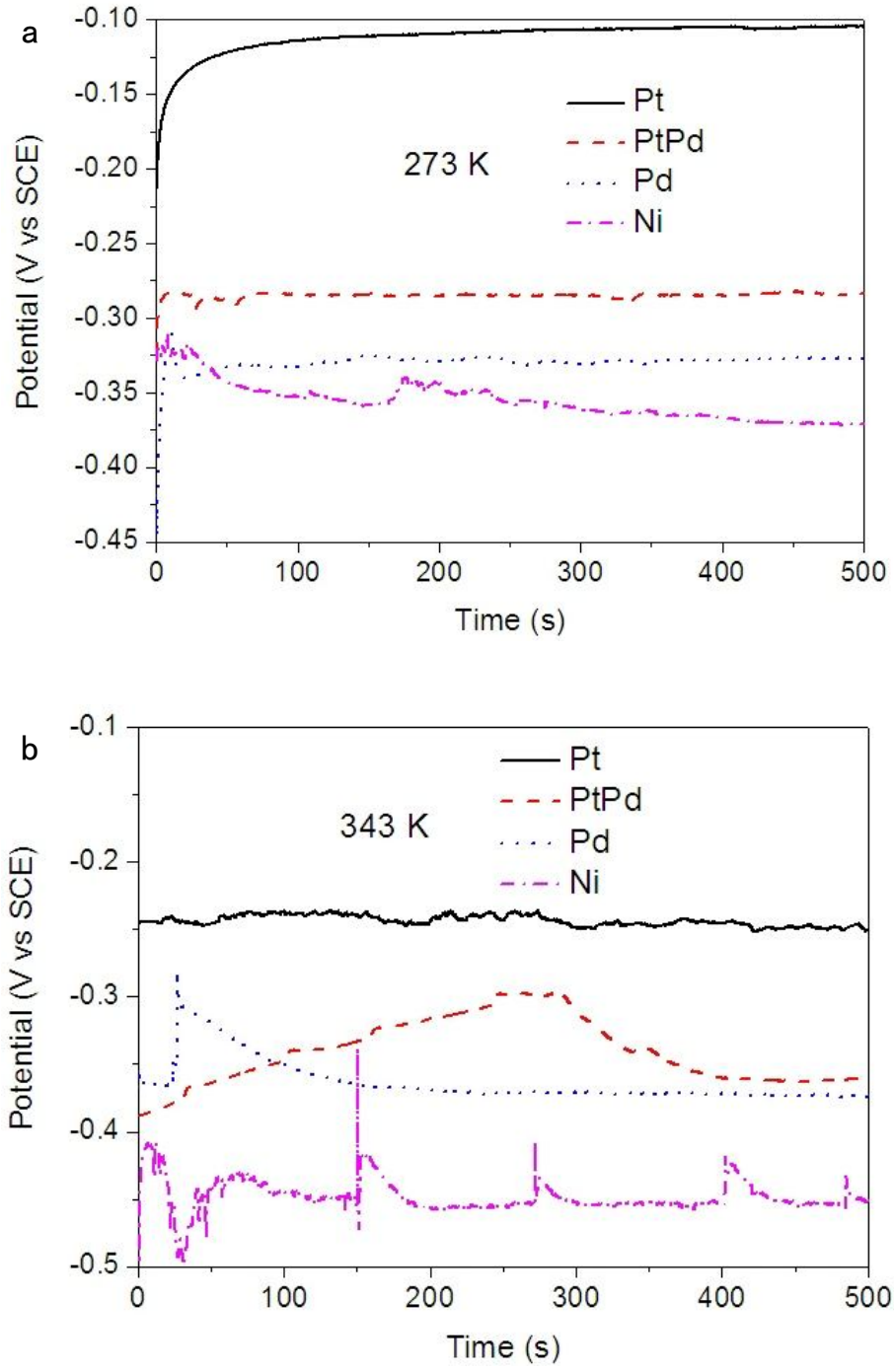


**Fig. S1.** The open-circuit potential *vs.* time curves of the $Al_2(Au,X)$ (X=Pt, Pd, PtPd and Ni) alloys in the 1.0 M NaCl solution at (a) 273 and (b) 343 K.

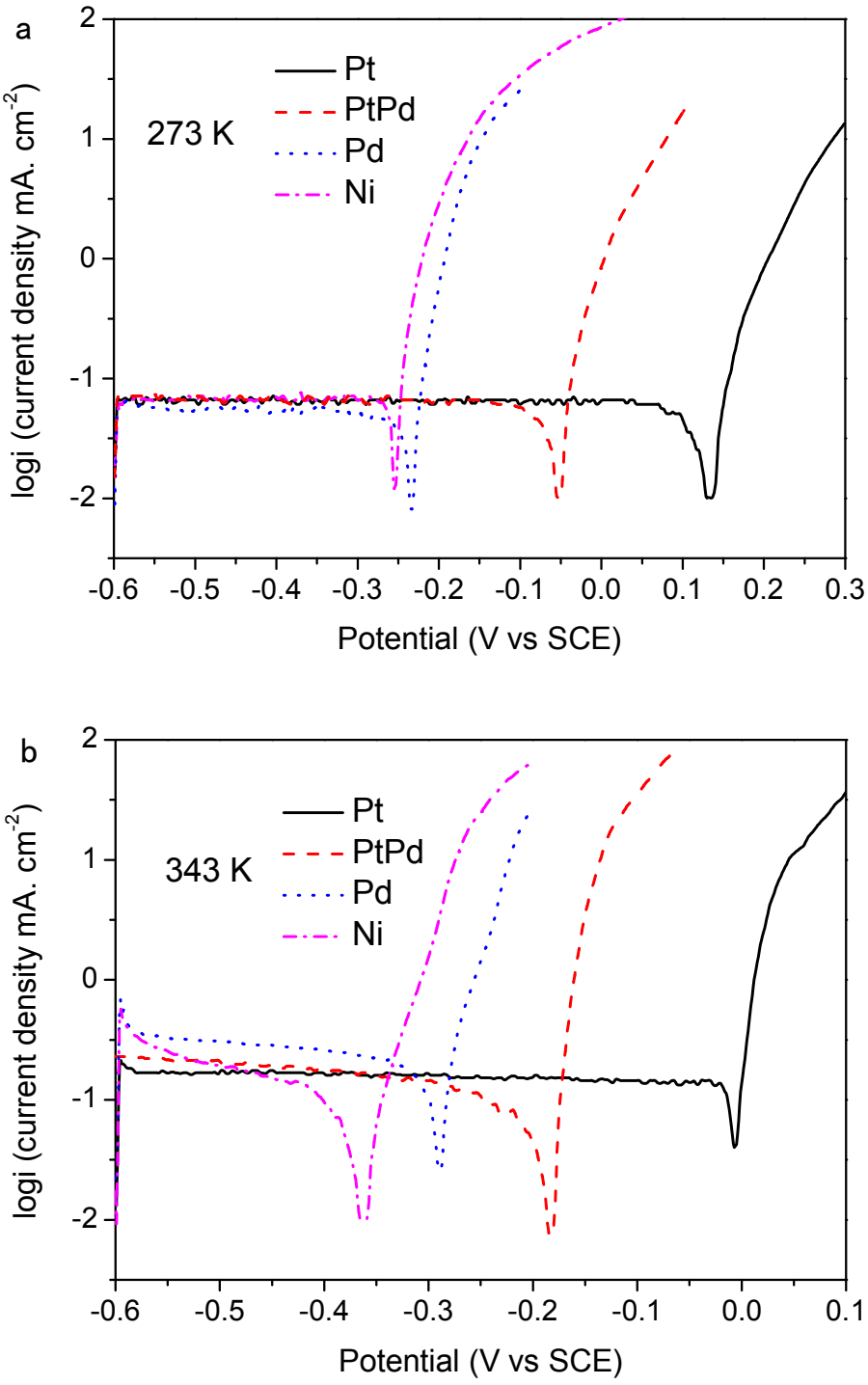


**Fig. S2.** The potentiodynamic polarization curves of the $Al_2(Au,X)$ (X=Pt, Pd, PtPd and Ni) alloys in the 1.0 M NaCl solution at (a) 273 and (b) 343 K.

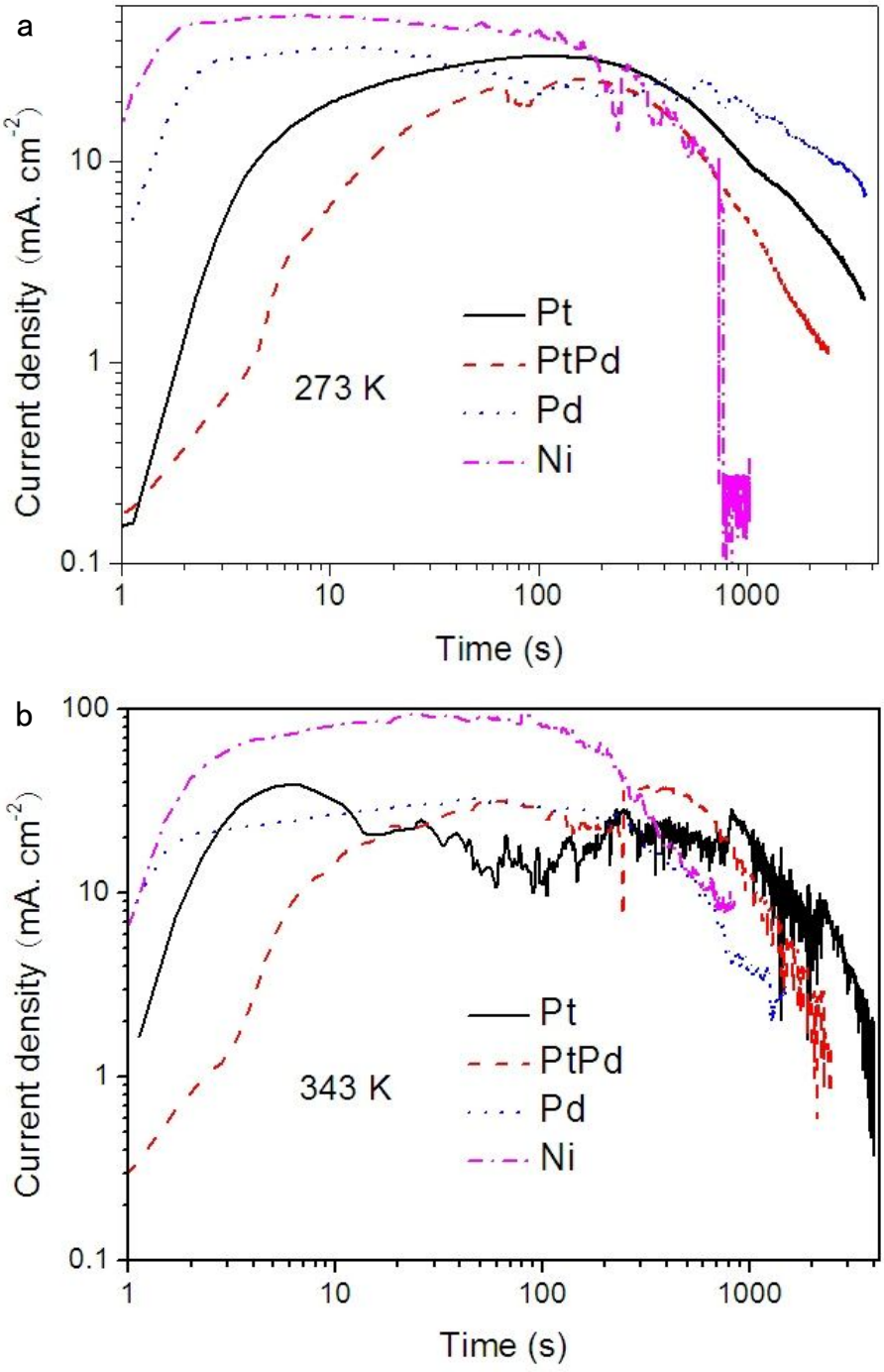


**Fig. S3.** The current density *vs.* time (chronoamperometric) curves for the potentiostatic dealloying of the $Al_2(Au,X)$ (X=Pt, Pd, PtPd and Ni) alloys in the 1.0 M NaCl solution at different overpotentials (100 mV for Pt, Pd and PtPd; 300 mV for Ni) at (a) 273 and (b) 343 K.

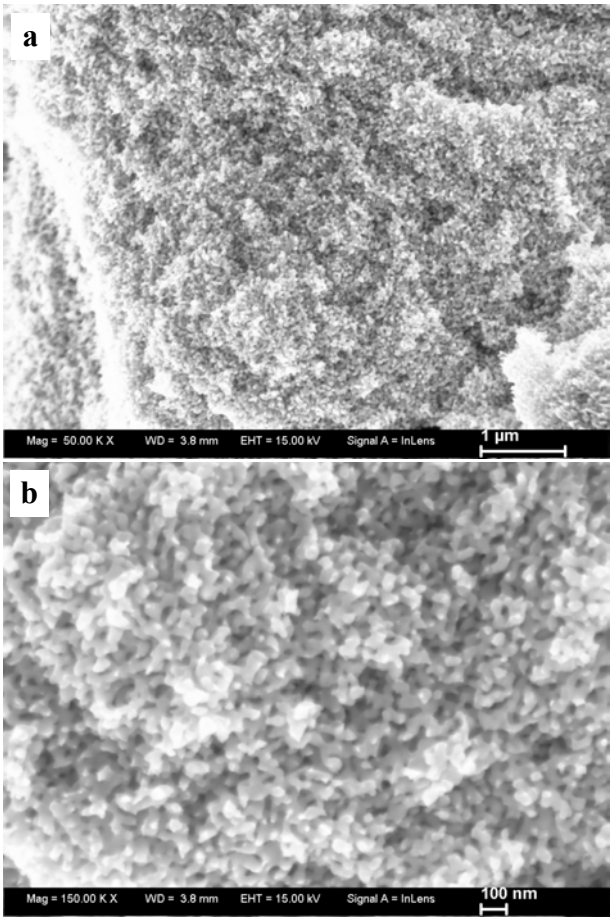


**Fig. S4.** Typical SEM images of np-Au fabricated by electrochemically dealloying pure $Al_2Au$ alloy in 1.0 M NaCl solution at the overpotential of 100 mV and 273 K.

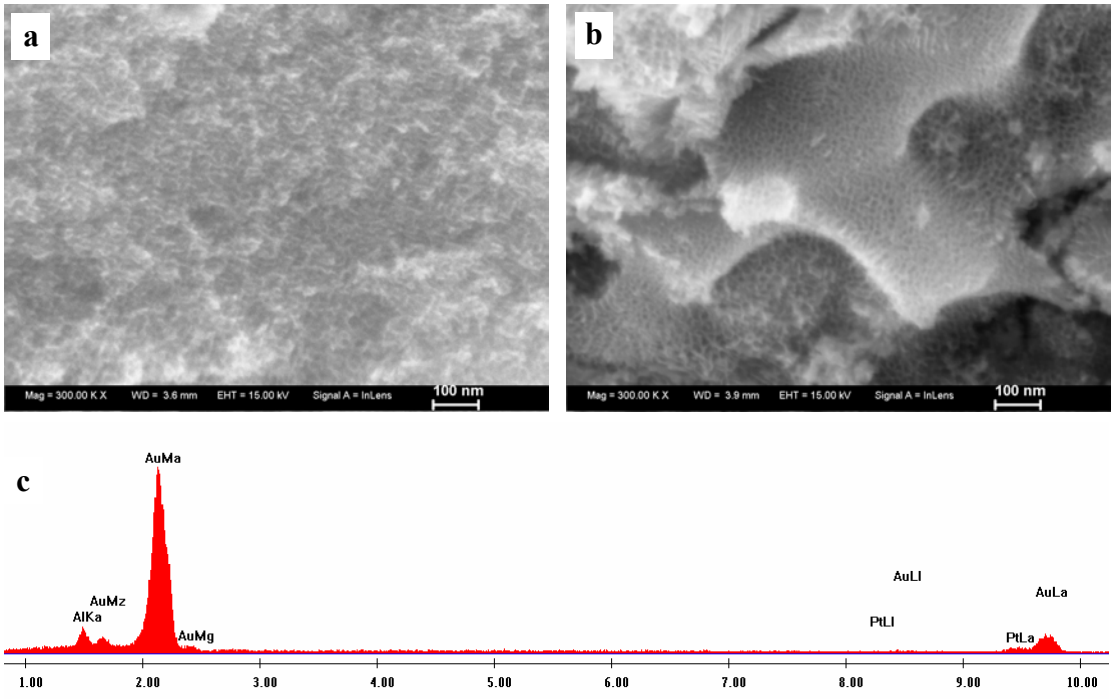


**Fig. S5**. (a,b) SEM images showing the microstructure of the np-AuPt alloy fabricated by potentiostatically dealloying the $Al_2$(Au,Pt) alloy in the 1.0 M NaCl solution at the overpotential of 100 mV and different temperatures (a: 298 K; b: 343 K). (c) EDX spectrum of the sample obtained at 343 K.

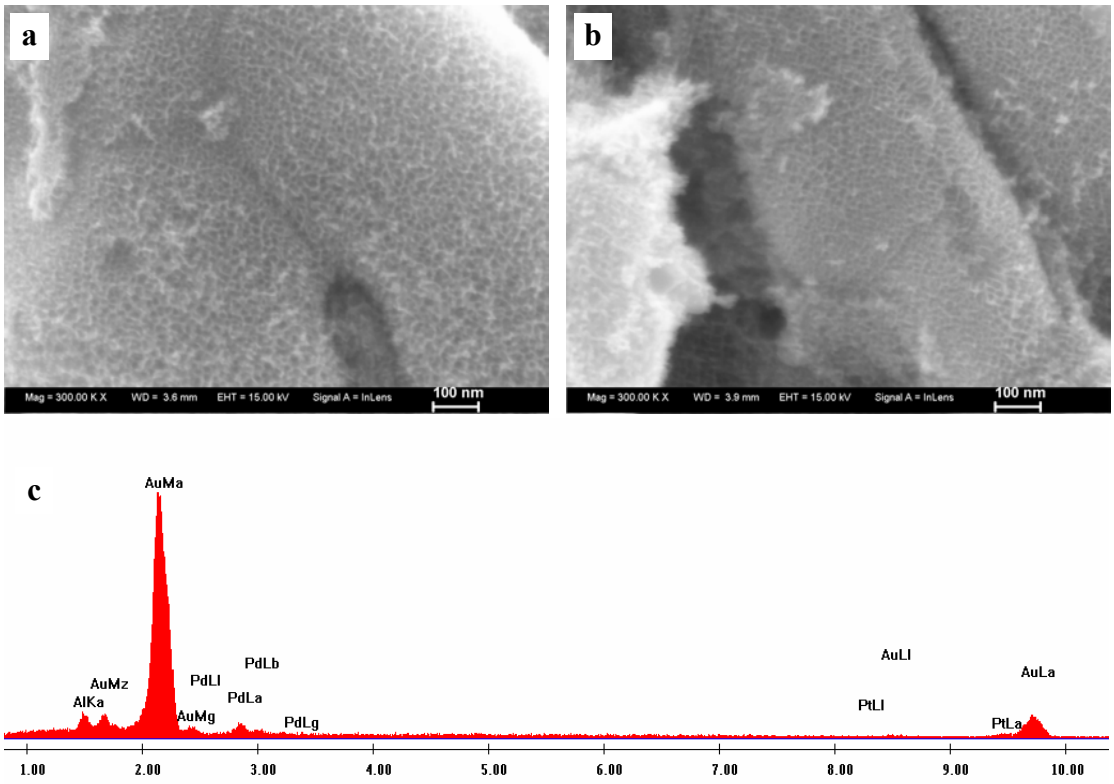


**Fig. S6**. (a,b) SEM images showing the microstructure of the np-AuPtPd alloy fabricated by potentiostatically dealloying the $Al_2$(Au,Pt,Pd) alloy in the 1.0 M NaCl solution at the overpotential of 100 mV and different temperatures (a: 298 K; b: 343 K). (c) EDX spectrum of the sample obtained at 343 K.

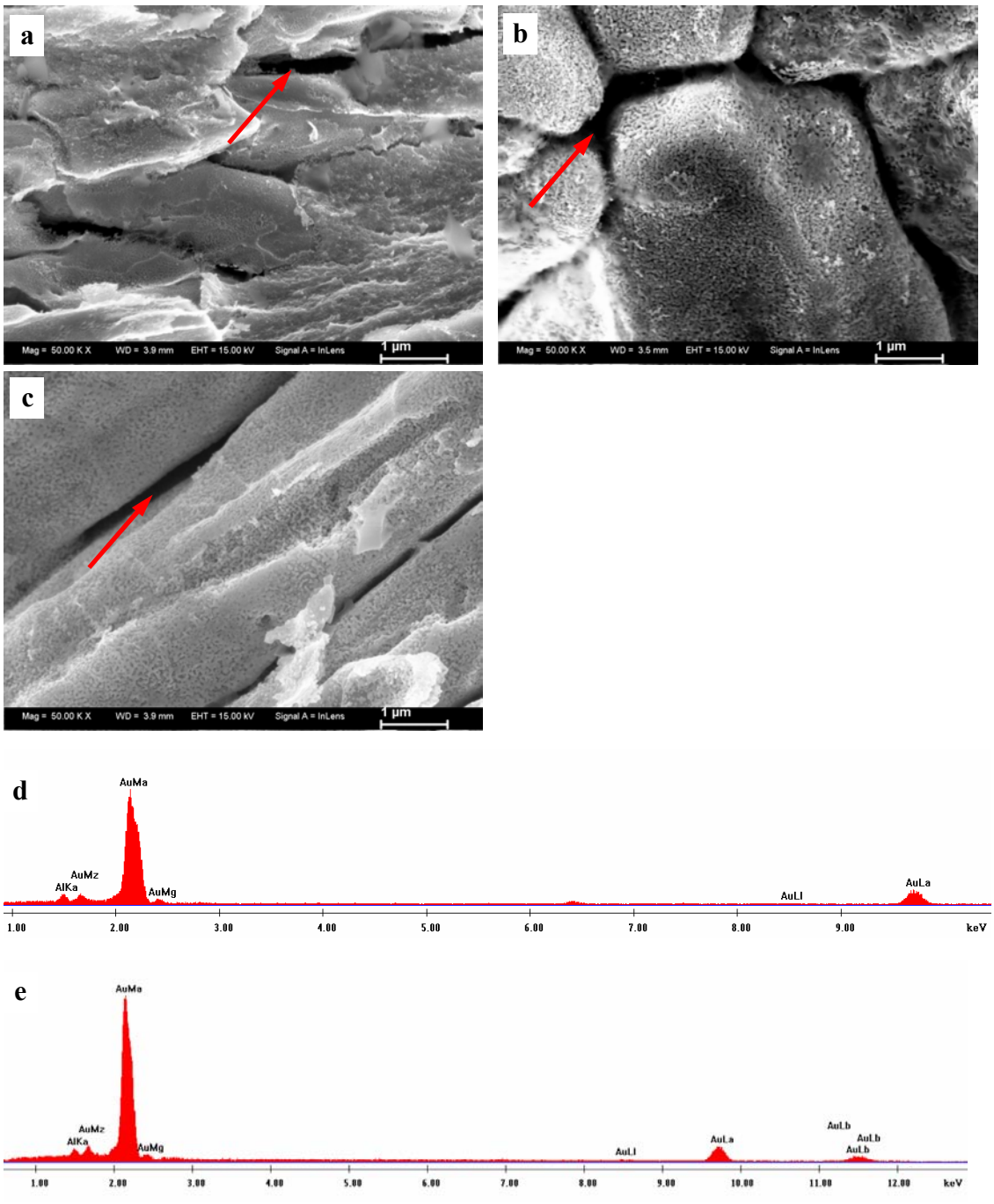


**Fig. S7**. (a-c) SEM images showing the microstructure of the np-Au samples fabricated by potentiostatically dealloying the (a,b) $Al_2$(Au,Ni) and (c) $Al_2$(Au,Co) alloys in the 1.0 M NaCl solution at the overpotential of 300 mV and different temperatures (a: 273 K; b,c: 298 K). (d,e) EDX spectra of the np-Au samples fabricated by potentiostatically dealloying the $Al_2$(Au,Ni) and $Al_2$(Au,Co) alloys respectively.

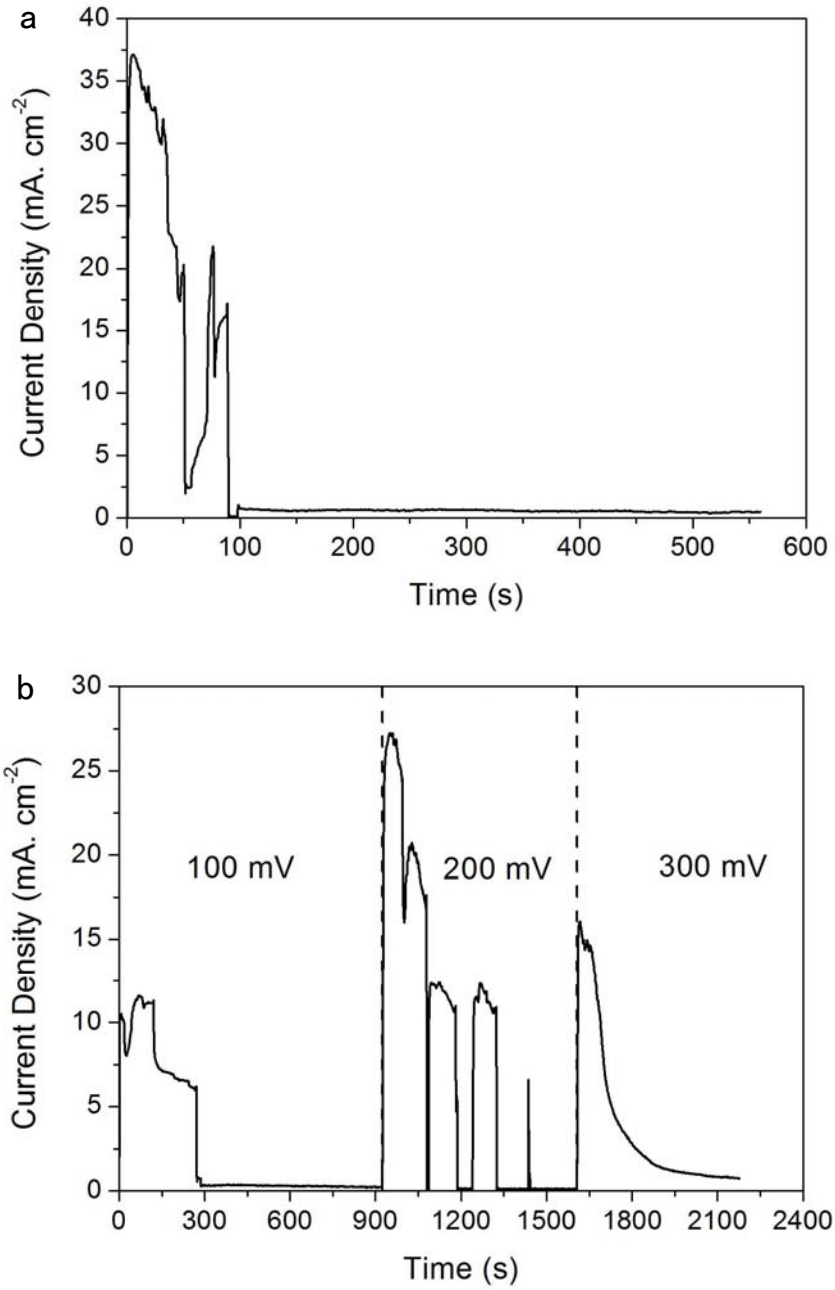


**Fig. S8.** The current density *vs.* time (chronoamperometric) curve for (a) one-stage (at the overpotential of 300 mV) and (b) three-stage (successive application of overpotentials of 100, 200 and 300 mV) potentiostatic dealloying of the $Al_2$(Au,Ni,Co) alloy in the 1.0 M NaCl solution at 298 K.