In-situ electrochemical activation as a generic strategy for promoting electrocatalytic hydrogen evolution reaction and alcohol electro-oxidation in alkaline medium

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**Fig. S1:** SEM image of AuPd NPs.

**Fig. S2:** TEM image of AuPd NPs.
**Fig. S3:** EDS spectra of AuPd NPs.

**Fig. S4:** Cyclic voltammograms (CVs) of AuPd NPs in 0.5 M H2SO4 from scan 10 onwards. (Scan rate 50 mV s⁻¹)
Fig. S5: LSV polarization curves for the HER in 1 M NaOH on Pd/C and EA-Pd/C electrocatalysts.
Fig. S6: Voltammetric profile of (a) Pd and EA-Pd, (b) Pd/C and EA-Pd/C. All experiments were conducted in a 1 M aqueous solution of ethanol using 1 M NaOH as the supporting electrolyte at a scan rate of 50 mV s⁻¹.
Fig. S7: Voltammetric profile of (a) Pd and EA-Pd, (b) Pd/C and EA-Pd/C. All experiments were conducted in a 1 M aqueous solution of methanol using 1 M NaOH as the supporting electrolyte at a scan rate of 50 mV s$^{-1}$. 
**Fig. S8**: Two hundred consecutive CV curves measured in 1M methanol and 1 M NaOH at (a) EA-AuPd, (b) AuPd.
Fig. S9: Chronoamperometry curves of EA-AuPd and AuPd catalysts for the EOR measured at -0.3 V (vs. Ag/AgCl). All experiments were conducted in 1 M ethanol + 1 M NaOH.
**Fig. S10:** Comparison of CV curves in 1.0 M NaOH solution for the Pd/C, before and after being subjected to EA process (Scan rate 50 mV s\(^{-1}\)).
Fig. S11: SEM image of (a) AuPd, (b) EA-AuPd.