catalysts

Supplementary Materials: Cu modified Pt Nanoflowers with Preferential (100) Surfaces for Selective Electroreduction of Nitrate

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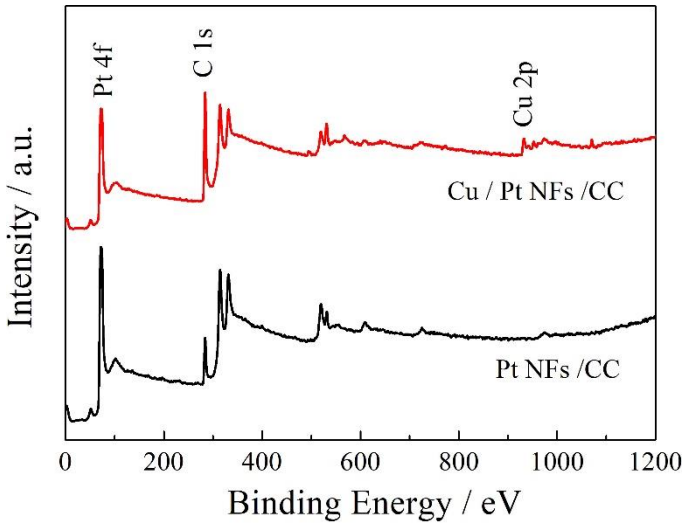

Figure S1. XPS survey spectra of Pt NFs / CC and Cu / Pt NFs / CC.

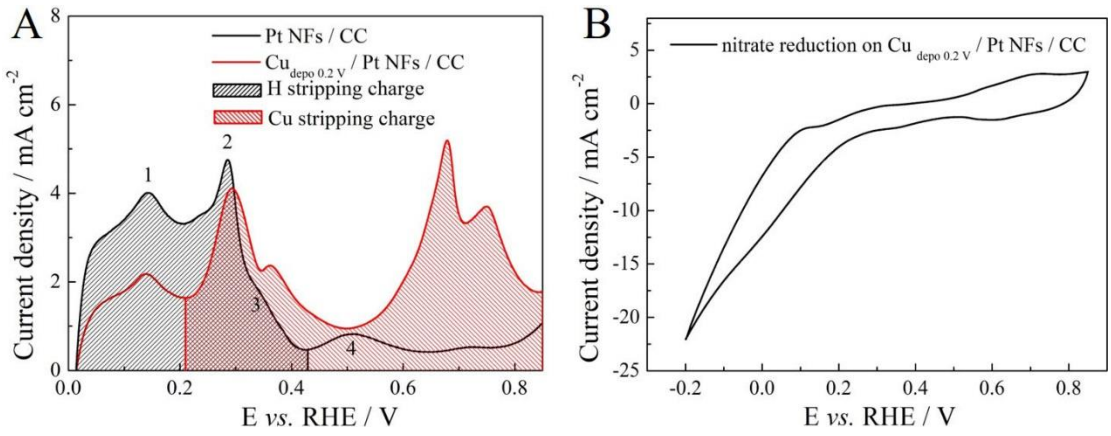

Figure S2. (**A**) H stripping curve of Pt NFs / CC (blank curve) and Cu stripping curve of $Cu_{depo\ 0.2\ V}$ / Pt NFs / CC (red curve) in 0.5 M H_2SO_4, (**B**) CVs of $Cu_{depo\ 0.2\ V}$ / Pt NFs / CC in 0.1 M NaOH containing 20 mM NO_3^-. Scan rate is 20 mV s^{-1}.

In order to demonstrate the effect of Cu coverage of Cu modified Pt NFs on nitrate reduction, $Cu_{depo\ 0.2\ V}$ / Pt NFs / CC was prepared by carrying out the Cu deposition potential of 0.2 V for 300 s for Cu modification on Pt NFs / CC. Different from the Cu / Pt NFs / CC, the bulk Cu are covered on the surface of Pt NFs [1,2]. As shown in Figure S2A, hydrogen adsorption on the Pt(110) step sites remains ca. 0.14 V with a diminution of the current density but the peaks for the hydrogen adsorption on the Pt(100) step sites and terraces disappear compared to the bare Pt NFs / CC, indicating that Cu atoms are totally covered on the surface of Pt(100) with the coverage of ca. 65.8% (calculated from the H desorption charge and Cu stripping charge by integrating the shaded areas depicted in Figure S2A). Not surprisingly, $Cu_{depo\ 0.2\ V}$ / Pt NFs / CC displays a lower activity for nitrate reduction which

caused by the bulk Cu deposited on Pt NFs, and no N_2 selective behavior is observed from the CVs in Figure S2B.

Reference

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2. Molodkina, E.B.; Ehrenburg, M.R.; Danilov, A.I.; Feliu, J.M. Two-dimensional Cu deposition on Pt(100) and stepped surfaces of platinum single crystals. *Electrochim. Acta* **2016**, *194*, 385–393, doi: 10.1016/j.electacta.2016.02.082.