Supporting Information

Catalytic Palladium Film Deposited by Scalable Low-Temperature Aqueous Combustion

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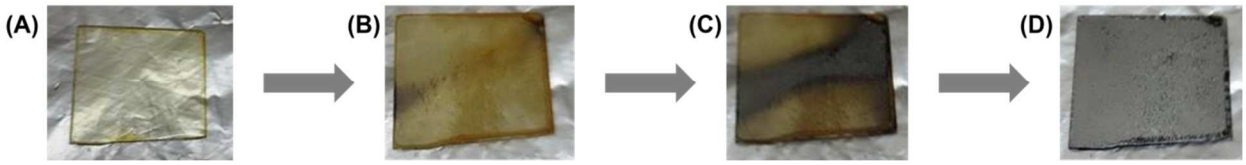

Figure S1. (A) Precursor solution on glass substrate (B) Gel formed after heating precursor solution at 250 ^{o}C, (C) Combustion with a front propagation, and (D) Formed Pd film on glass substrate after combustion.

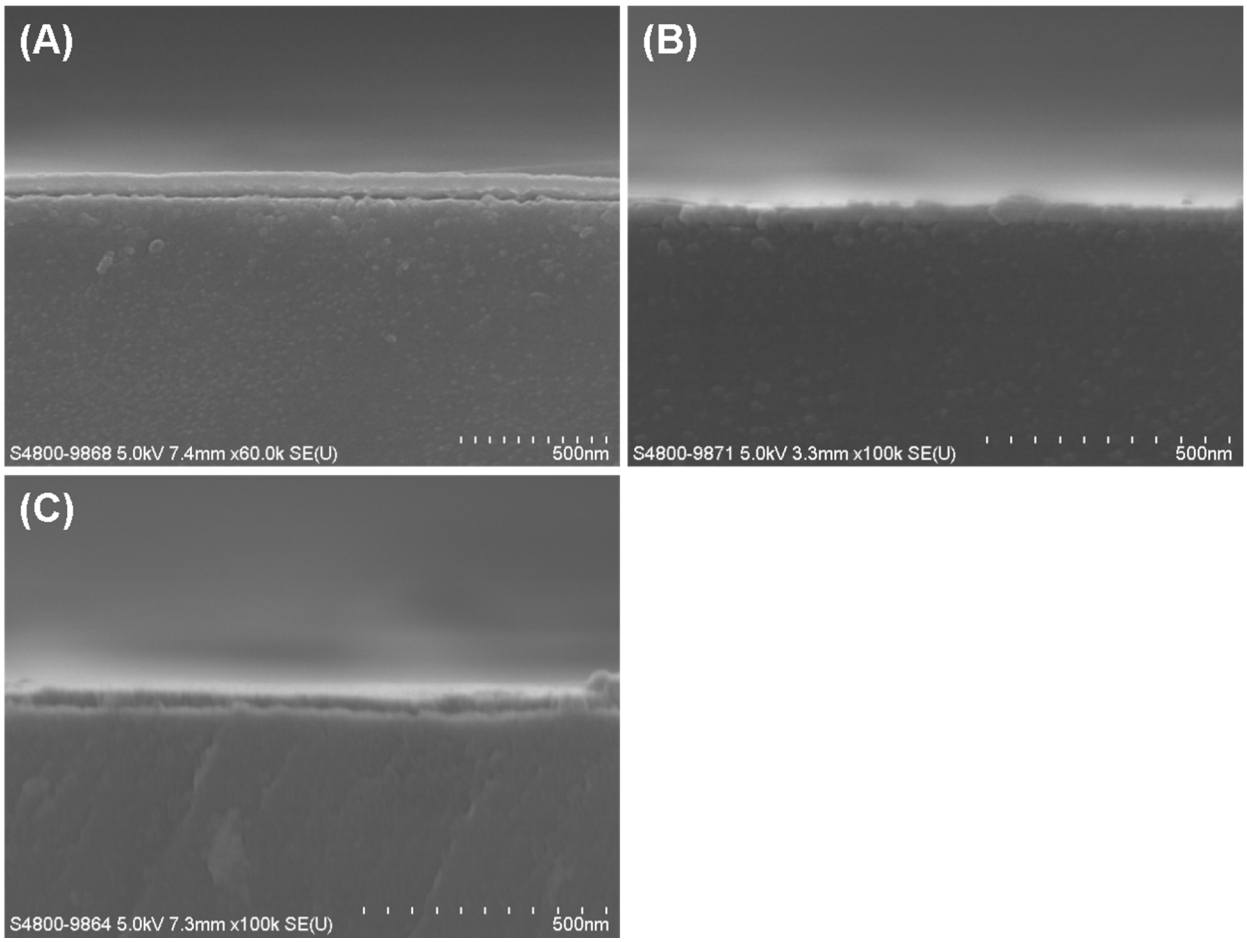

Figure S2. SEM cross-sectional images of Pd films deposited at different rotation speeds (A) 2000 (B) 3000, and (C) 5000 rpm respectively.

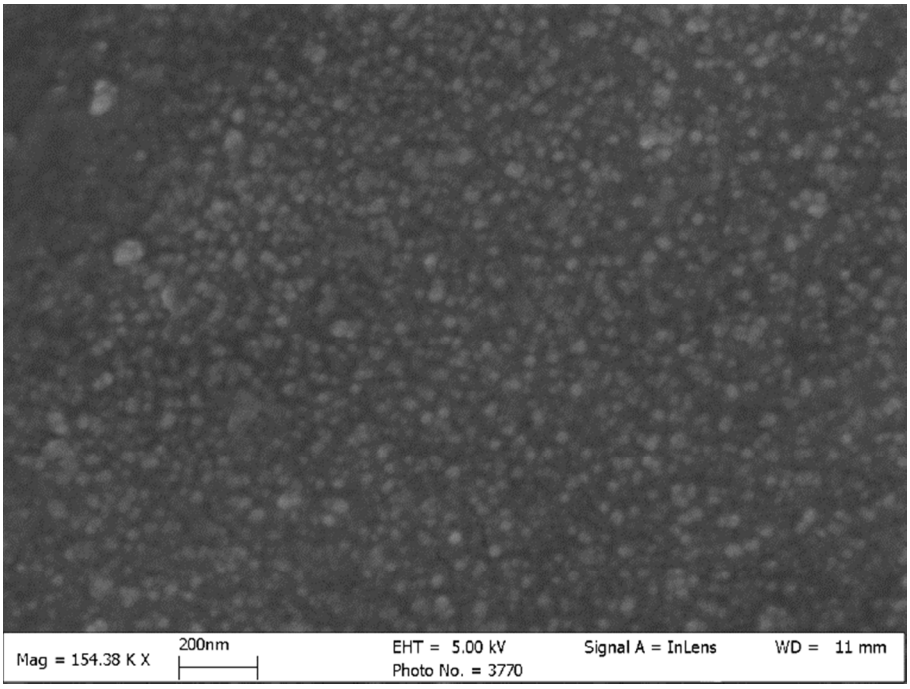

Figure S3. SEM image of the Pd film surface.

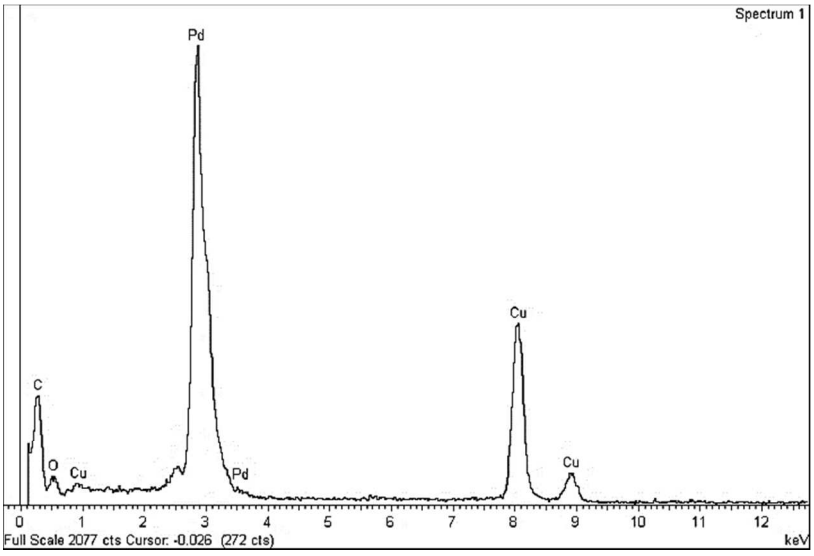

Figure S4. EDX spectra of the palladium film deposited by aqueous combustion method.

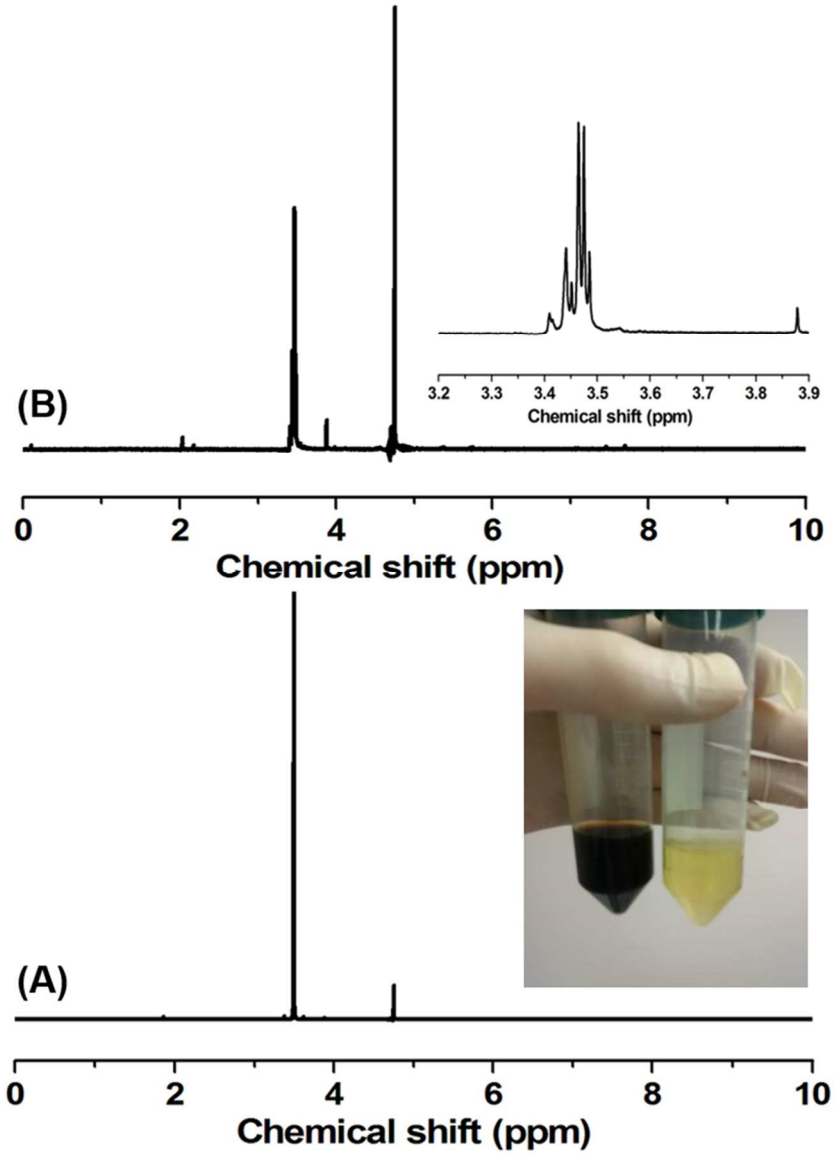

Figure S5. ^{1}H-NMR spectra of (A) glycine and (B) palladium nitrate-glycine precursor solution with 1:2 stoichiometric ratio heated at 80 ^{o}C (inset: image demonstrating color change of precursor solution from dark brown to pale yellow after heating to 80 ^{o}C.

Compared to pure NH_2CH_2COOH splitting at 3.45 ppm is observed indicating that the proton in methylene group has a different chemical environment and more shielded associated with the chelate formation (Figure S4A). The peak at 4.8 ppm is due to D_2O solvent.

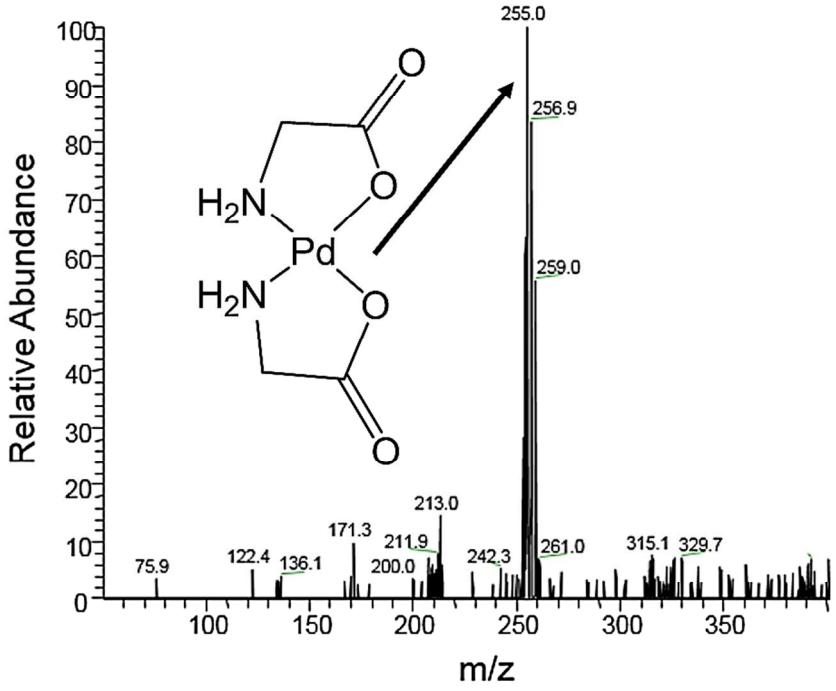

Figure S6. ESI-MS spectra of the palladium nitrate-glycine precursor solution with 1:2 stoichiometric ratio heated at 80 ^{o}C.

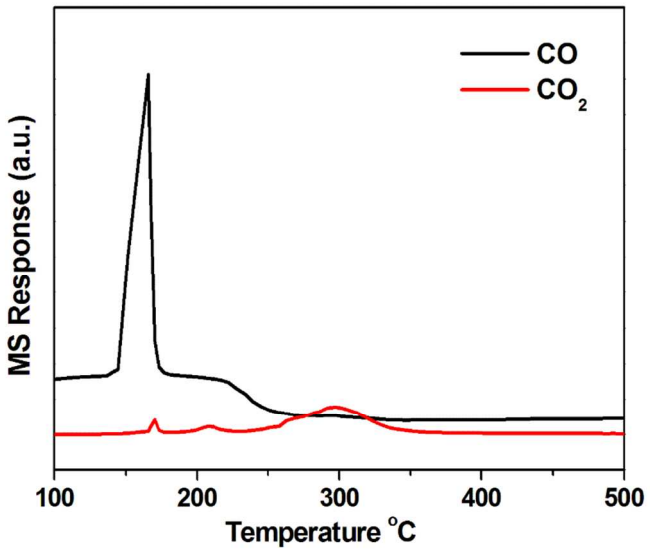

Figure S7. MS analysis of CO and CO_2 produced from combustion of $Pd(NO_3)_2$-NH_2CH_2-COOH=1:2 precursor mixture.

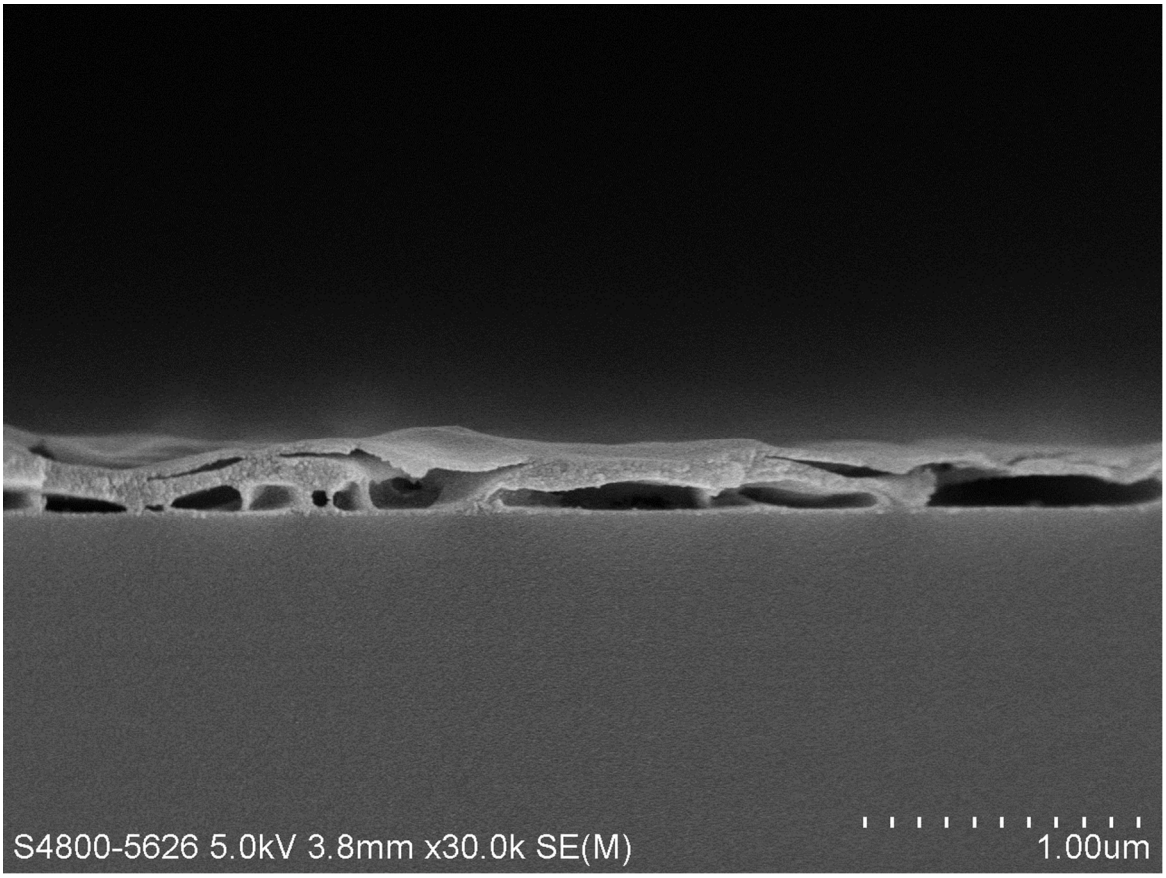

Figure S8. SEM cross-sectional image of Pd film deposited from precursor solution with $Pd(NO_3)_2$:NH_2CH_2COOH= 1:2 molar ratio.

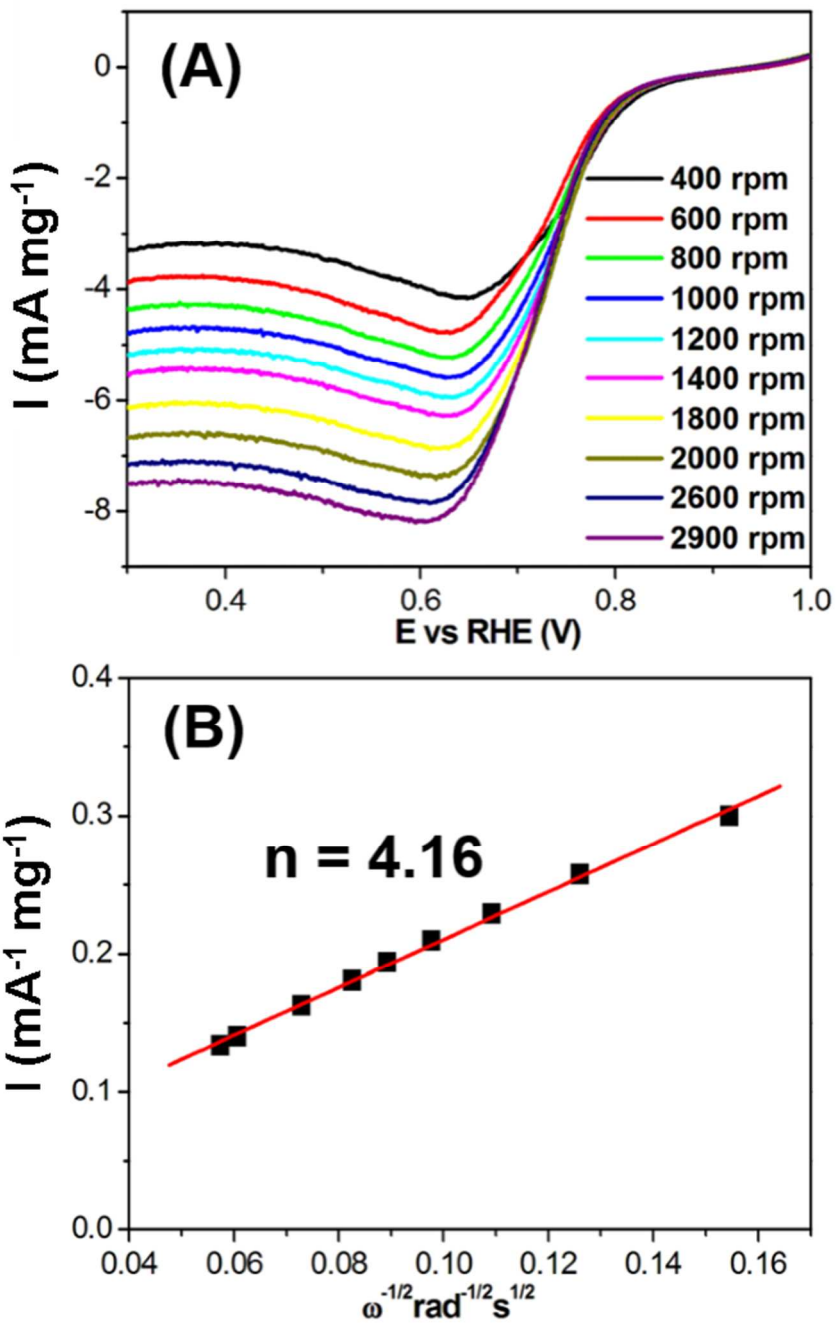

Figure S9. (A) ORR polarization curves for Pd film obtained in an oxygen saturated 0.1 M NaOH solution at a scan rate of 10 mV s^{-1} and different rotation rates and (B) Koutecky-Levich plot of I^{-1} versus $\omega^{-1/2}$ at 0.3 V vs RHE.