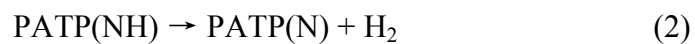
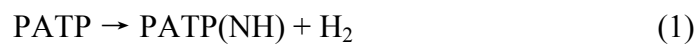
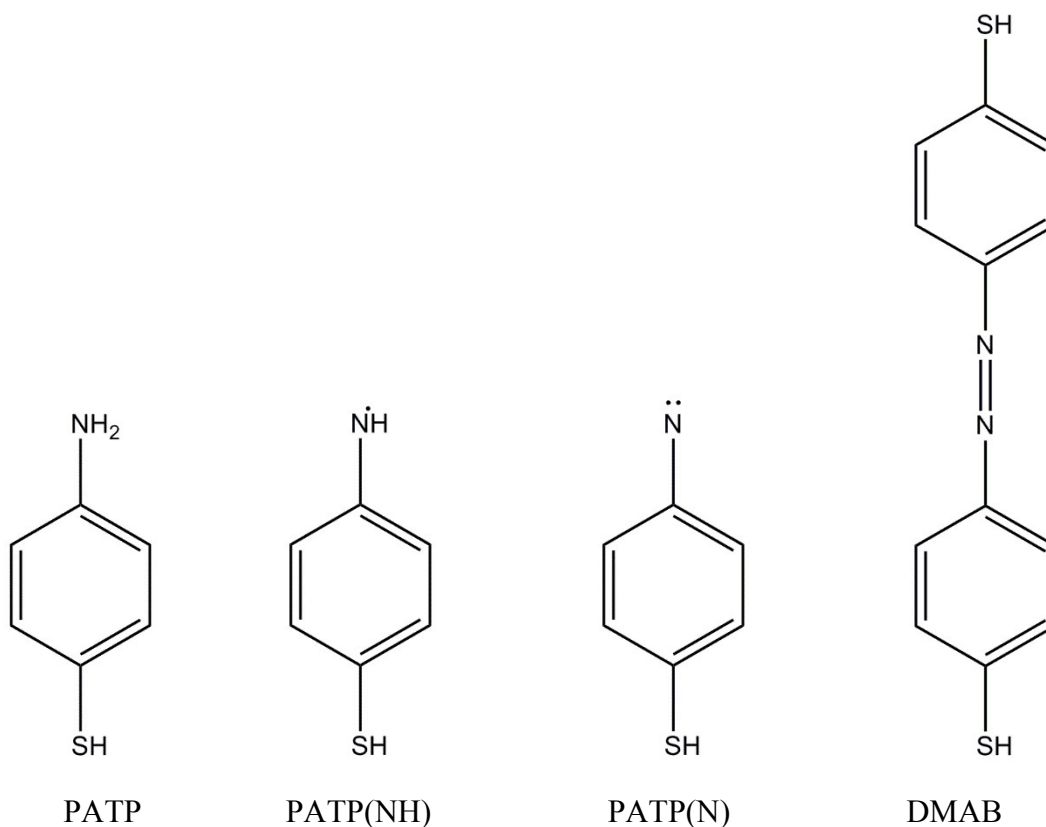
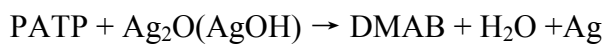


Supplementary Information

Proposed reaction path of PATP coupling into DMAB under O₂-free condition:



Proposed reaction path of PATP coupling into DMAB under O₂-rich condition:



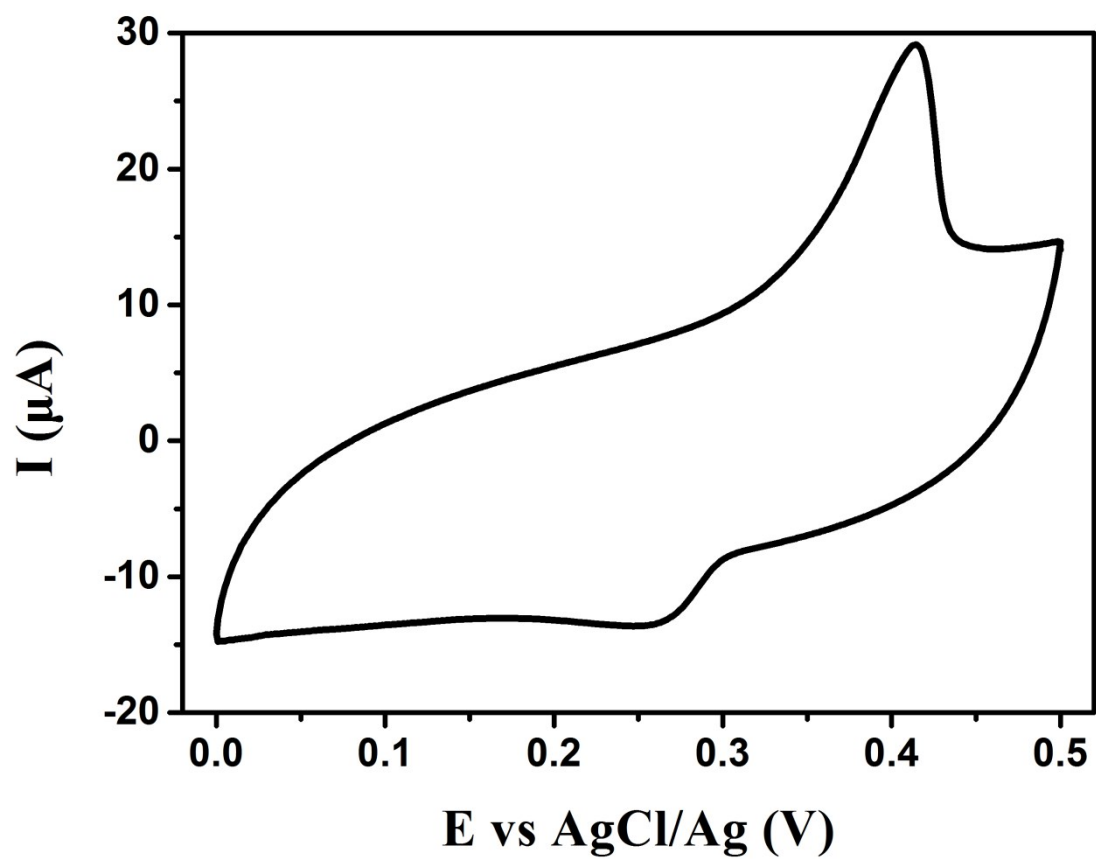


Fig. S1. Cyclic voltammogram of the graphite foil in the aqueous electrolyte of 1.0 mM KNO_3 and 0.1 mM AgNO_3 . Scan rate: 10 mV s^{-1} .

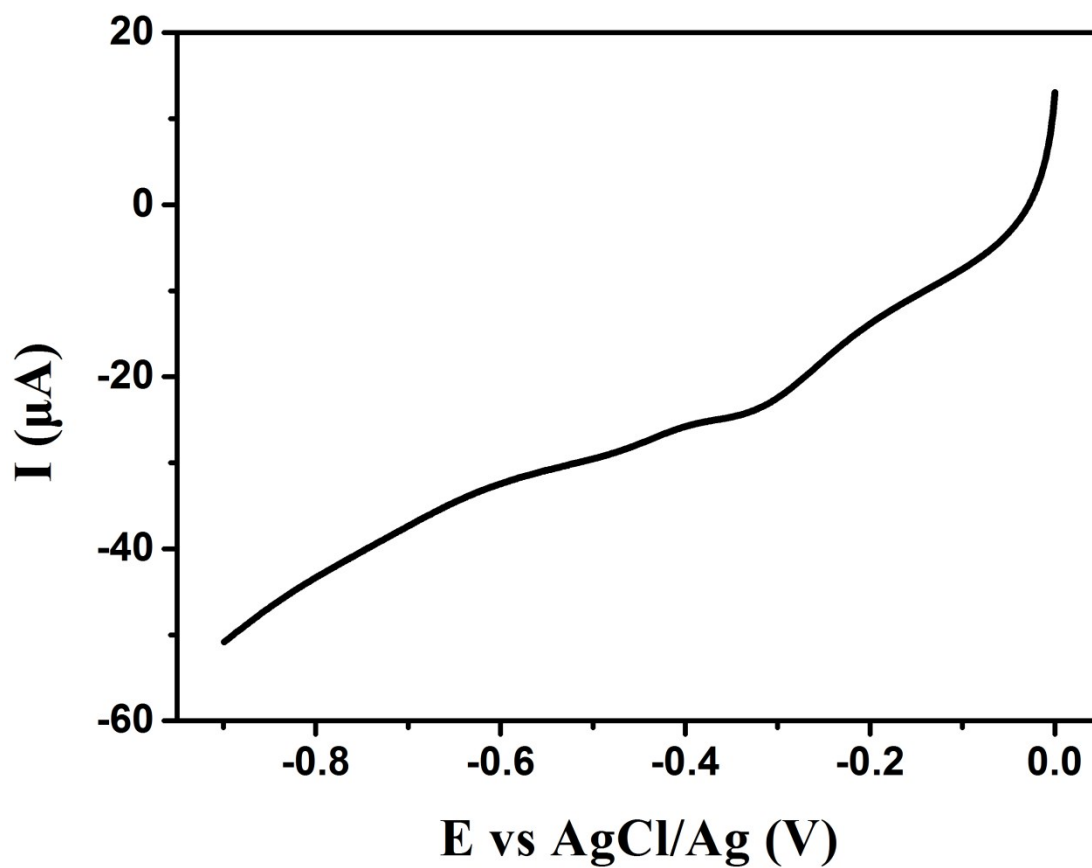


Fig. S2. Linear sweep voltammogram of DMAB adsorbed on the Ag-NPs/graphite in the aqueous electrolyte of 1.0 mM KNO₃. Scan rate: 5 mV s⁻¹.

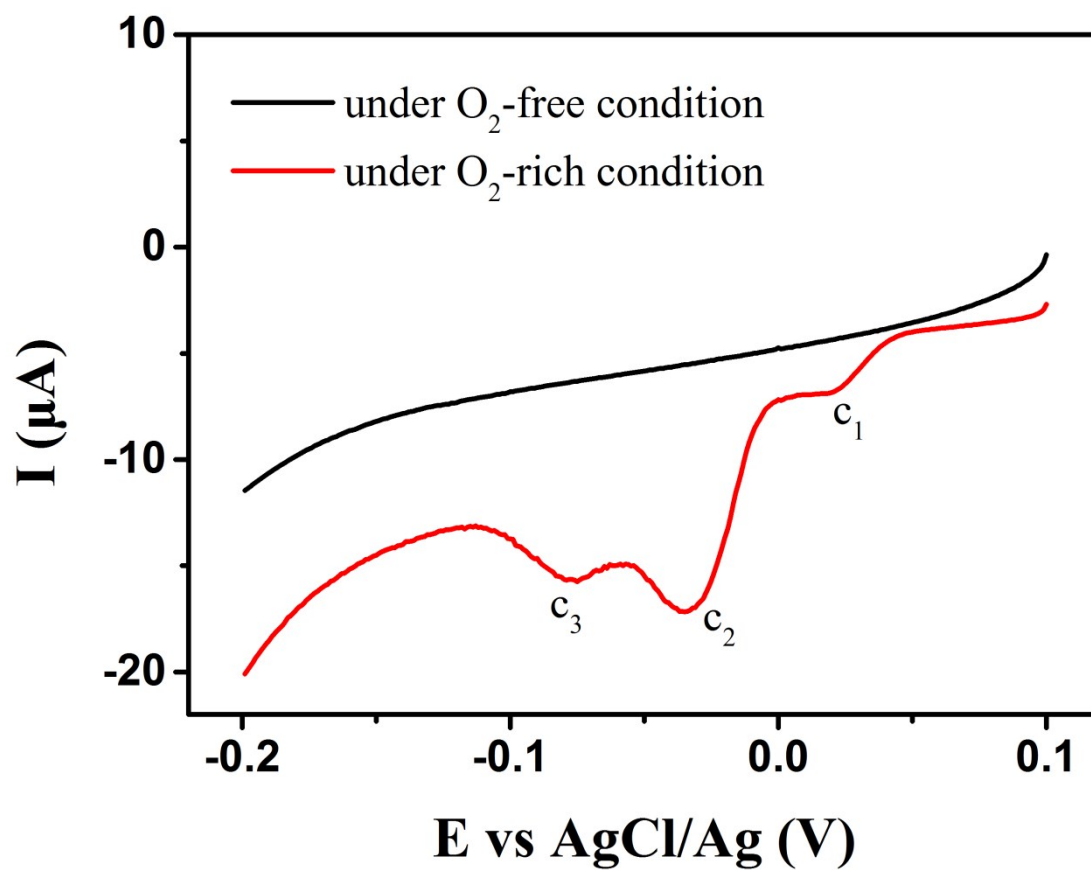


Fig. S3. Linear sweep voltammogram of the Ag-NPs/graphite after the laser irradiation under O₂-free and O₂-rich conditions in the aqueous electrolyte of 1.0 mM KCl. Scan rate: 10 mV s⁻¹.

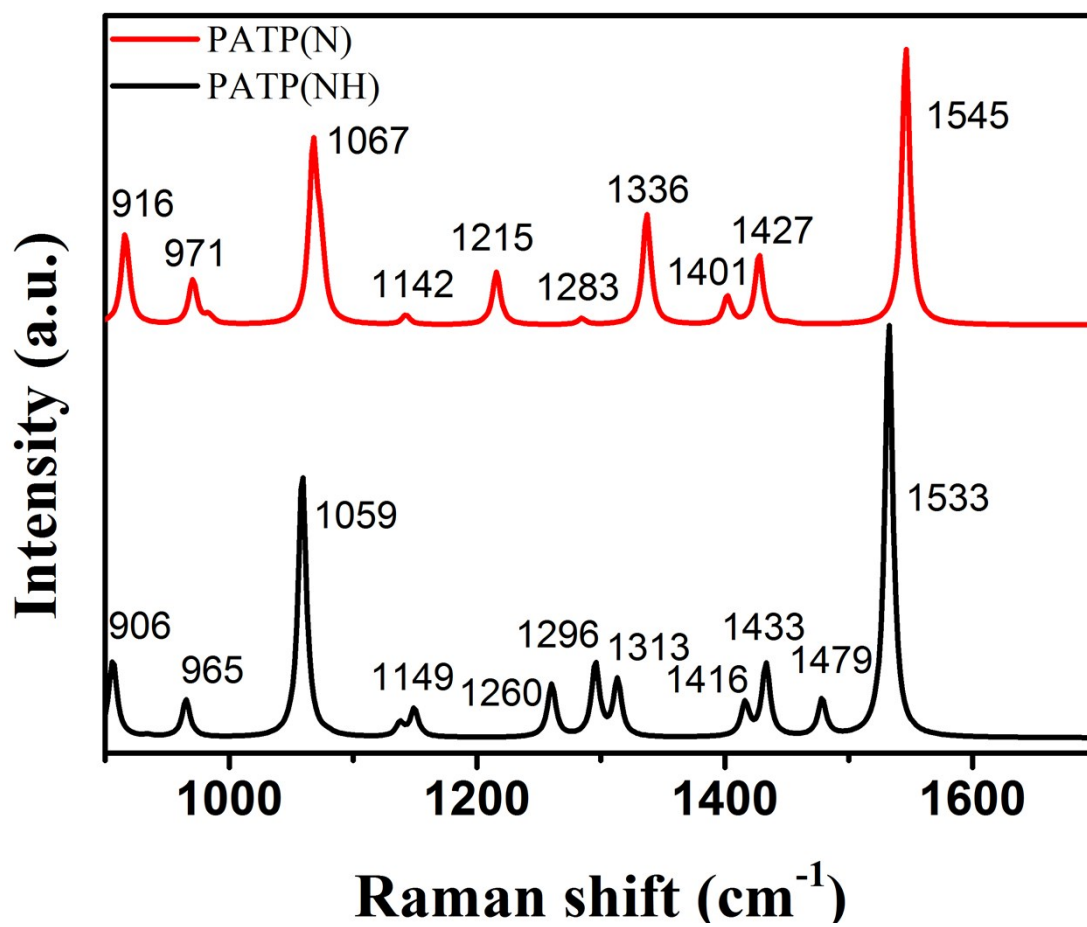


Fig. S4. Calculated Raman spectra of PATP(N) and PATP(NH)

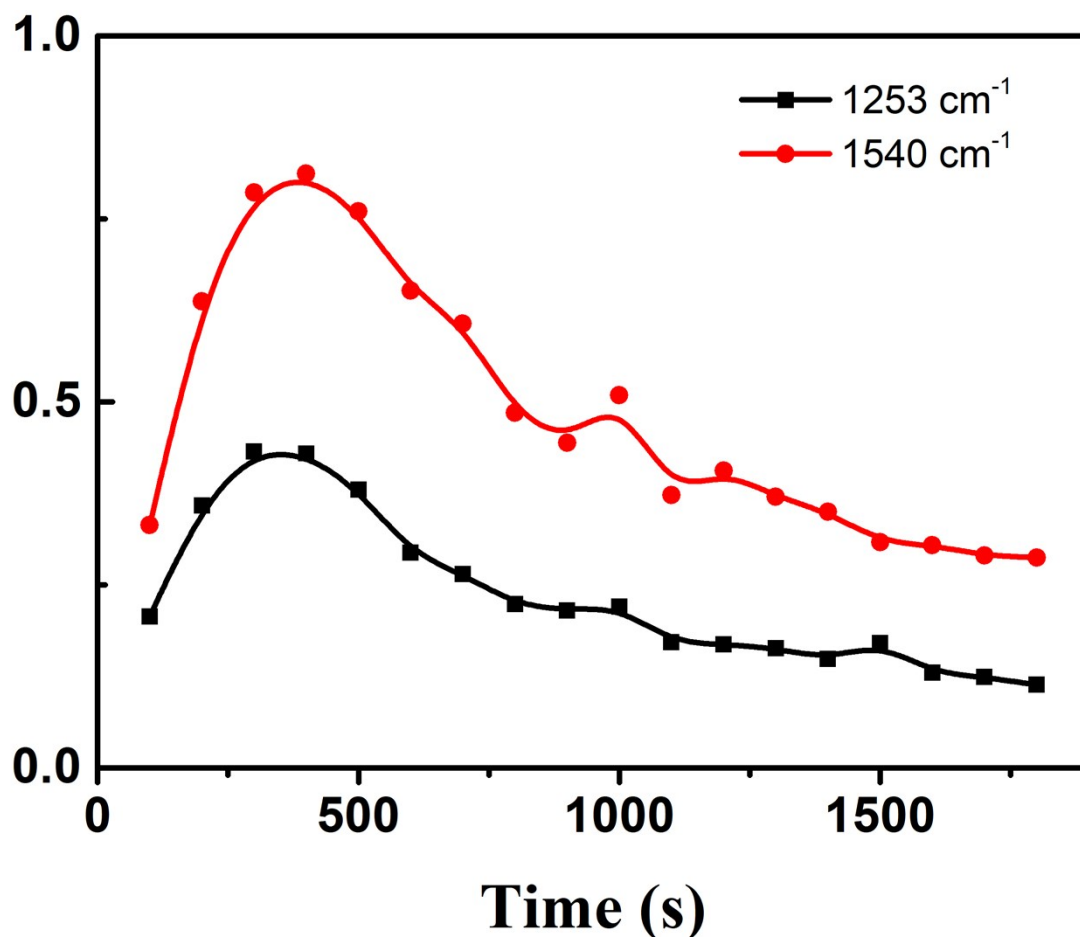


Fig. S5. The Raman intensity ratios of the 1253 cm⁻¹ and 1540 cm⁻¹ bands with respect to the 1080 cm⁻¹ band. Analysis is based on the data of figure 3a.

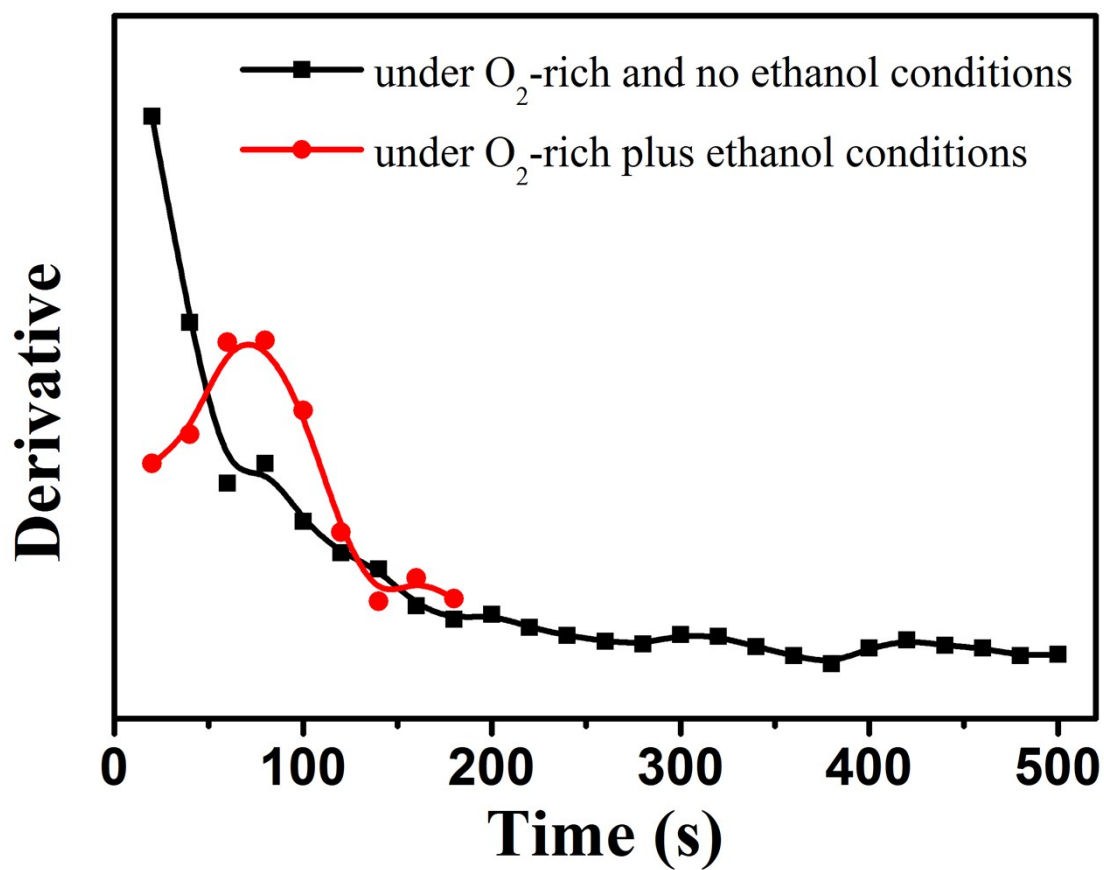


Fig. S6. Derivatives of the relative intensity of the 1143 cm⁻¹ band with respect to the 1080 cm⁻¹ band under O₂-rich and no ethanol conditions (black dot and line), and under O₂-rich plus ethanol conditions (red dot and line).

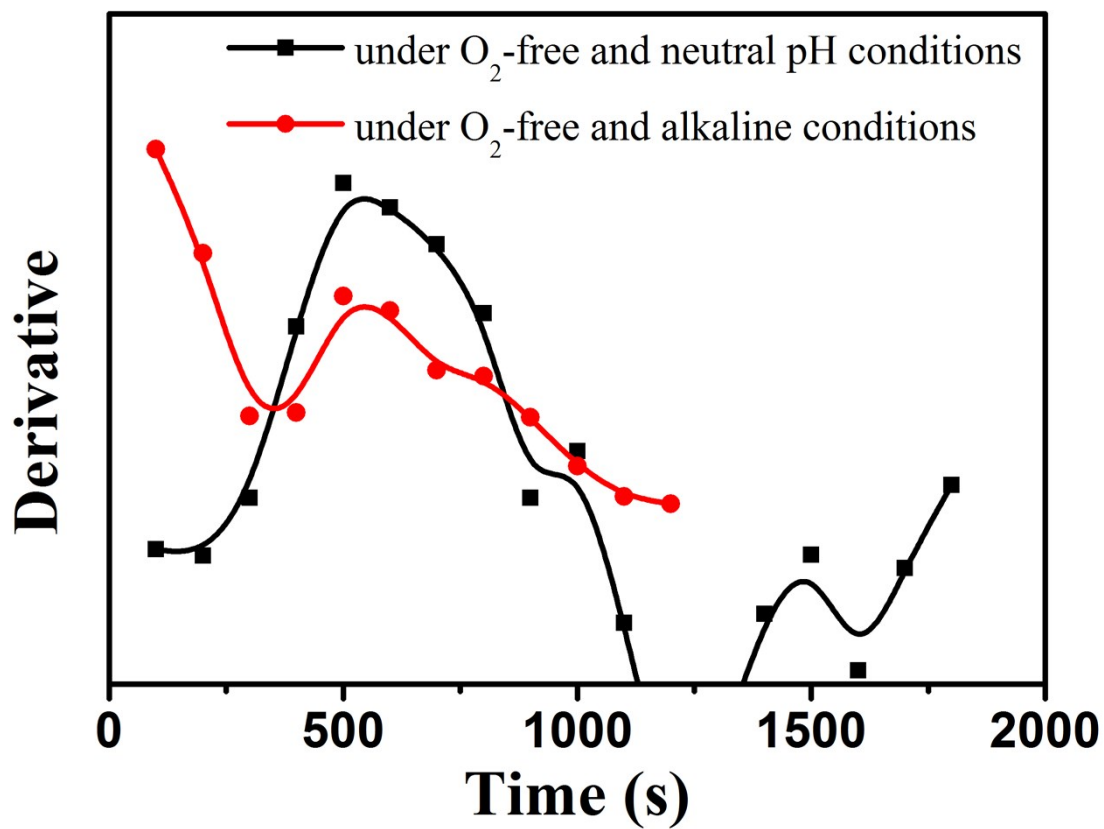


Fig. S7. Derivatives of the relative intensity of the 1143 cm^{-1} band with respect to the 1080 cm^{-1} band under O_2 -free and neutral pH conditions (black dot and line), and under O_2 -free and alkaline (pH 8.0) conditions (red dot and line).

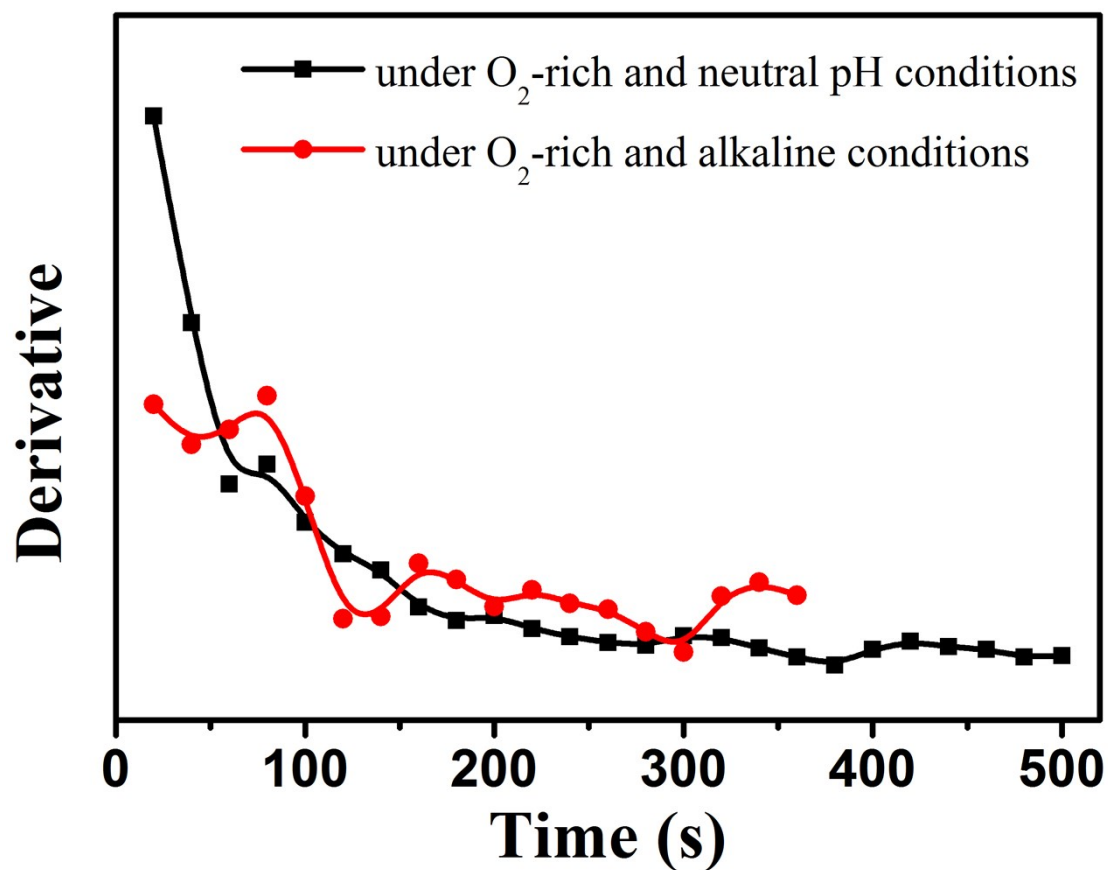


Fig. S8. Derivatives of the relative intensity of the 1143 cm^{-1} band with respect to the 1080 cm^{-1} band under O_2 -rich and neutral pH conditions (black dot and line), and under O_2 -rich and alkaline (pH 8.0) conditions (red dot and line).

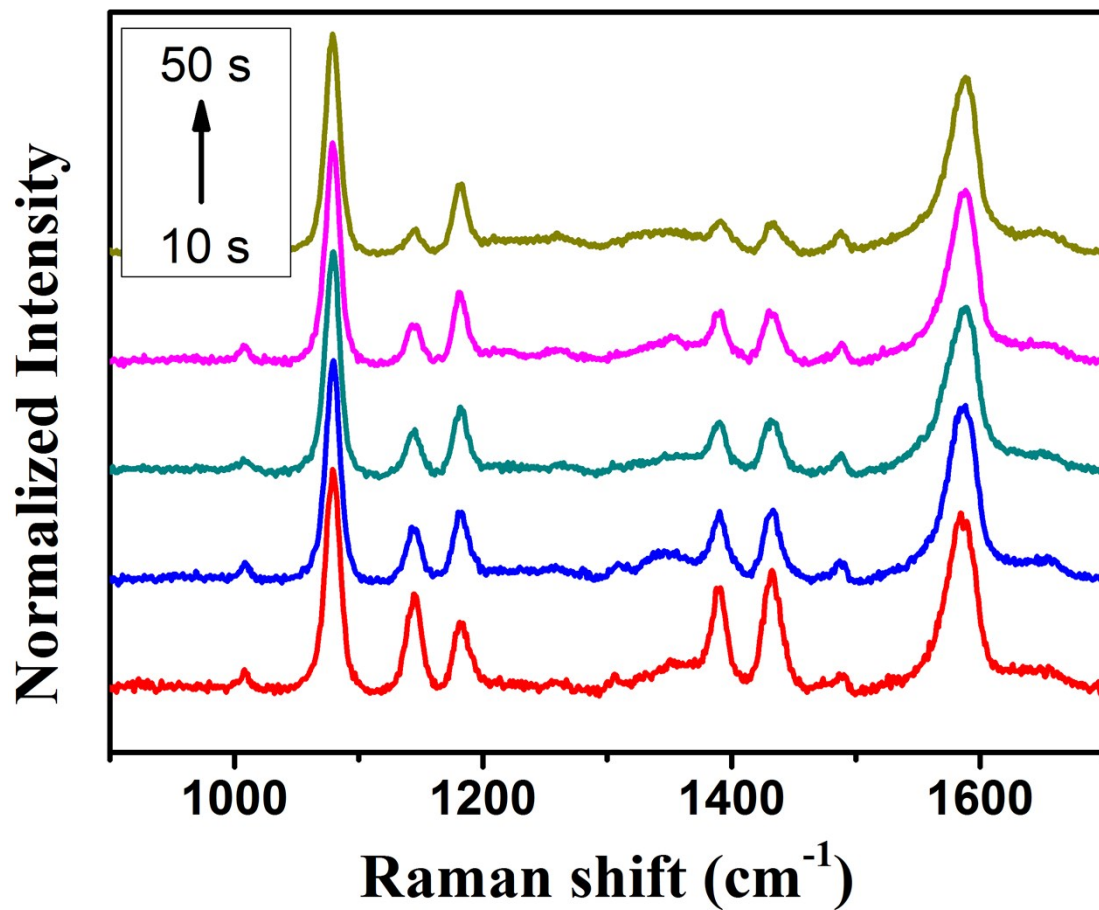


Fig. S9. Successive SERS measurements of DMAB adsorbed on the Ag-NPs/graphite under O₂-free and acidic (pH 3.0) conditions. The integration time of each spectrum was 10s. These spectra are normalized at the 1080 cm⁻¹ band.

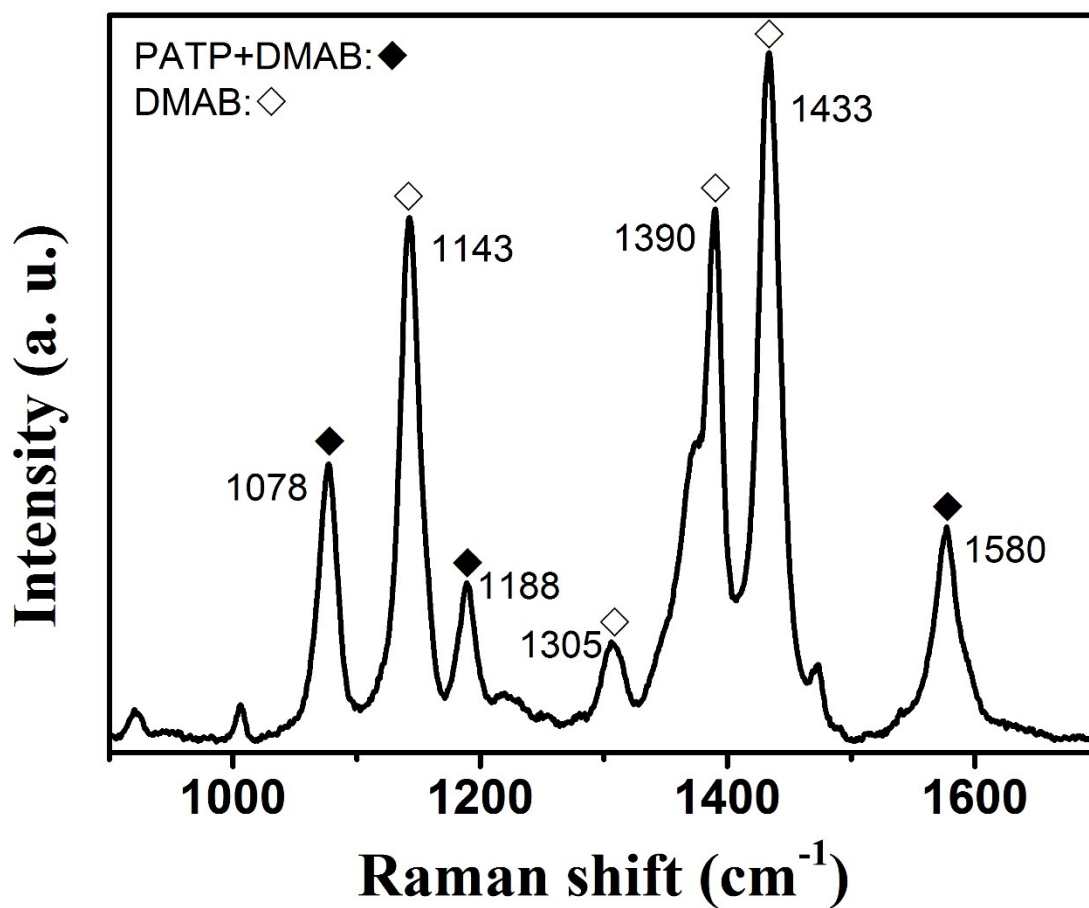


Fig. S10. SERS measurement after PATP and ethanol were added under O_2 -free condition onto Ag-NPs/graphite which was irradiated by the laser for 10 minutes under O_2 -rich condition. The integration time was 20 s.