

Supporting Information: The Mechanism of Electrochemical Reduction of Hydrogen Peroxide on Silver Nanoparticles

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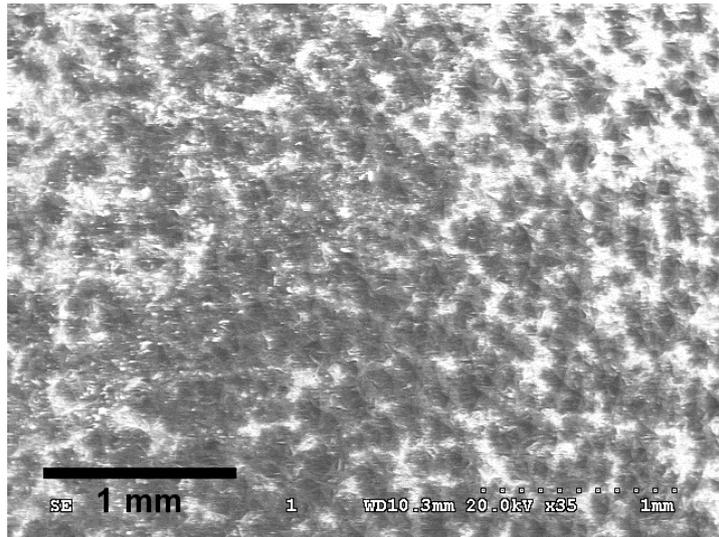
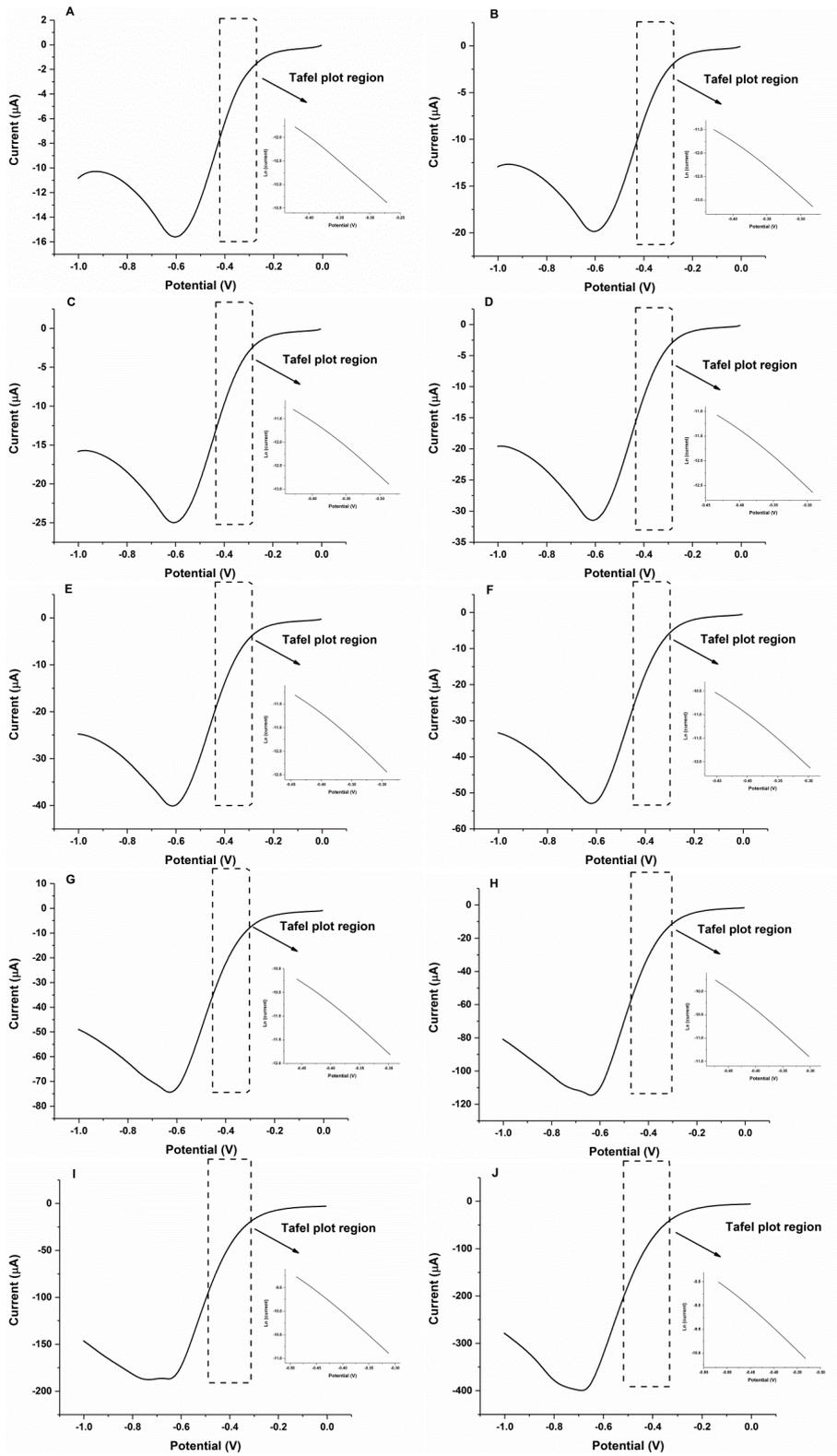


Figure S1. SEM images of AgNPs-BDDE under 35x magnification.



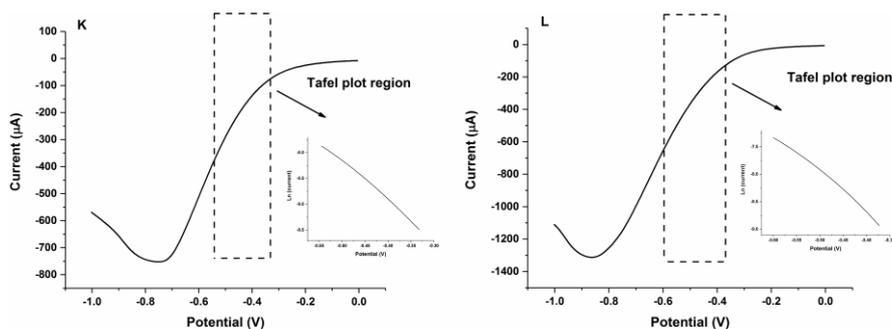


Figure S2. Tafel plots for AgNPs-BDDE recorded at a scan rate of 0.05 V s^{-1} with variable H_2O_2 concentrations of 0.01 mM (A), 0.02 mM (B), 0.04 mM (C), 0.08 mM (D), 0.16 mM (E), 0.32 mM (F), 0.64 mM (G), 1.2 mM (H), 2.4 mM (I), 4.8 mM (J), 9.6 mM (K), and 19.2 mM (L).

Table S1. The measured transfer coefficient ($\alpha = 0.25 \pm 0.04$) according to the Tafel slopes with the increasing H_2O_2 concentration for AgNPs-BDDE recorded at a scan rate of 0.05 Vs^{-1} .

H_2O_2 concentration (mM)	Tafel slope	α	α (average)
0.01	-10.38 ± 0.38	0.27 ± 0.0097	0.26 ± 0.04
0.02	-11.20 ± 0.22	0.29 ± 0.0057	
0.04	-11.17 ± 0.23	0.29 ± 0.0059	
0.08	-10.90 ± 0.24	0.28 ± 0.0062	
0.16	-10.52 ± 0.34	0.27 ± 0.0086	
0.32	-10.05 ± 0.38	0.26 ± 0.0098	
0.64	-9.64 ± 0.45	0.25 ± 0.011	
1.2	-9.24 ± 0.47	0.24 ± 0.012	
2.4	-8.87 ± 0.55	0.23 ± 0.014	
4.8	-8.29 ± 0.39	0.21 ± 0.010	
9.6	-7.42 ± 0.38	0.19 ± 0.010	
19.2	-6.86 ± 0.34	0.18 ± 0.010	

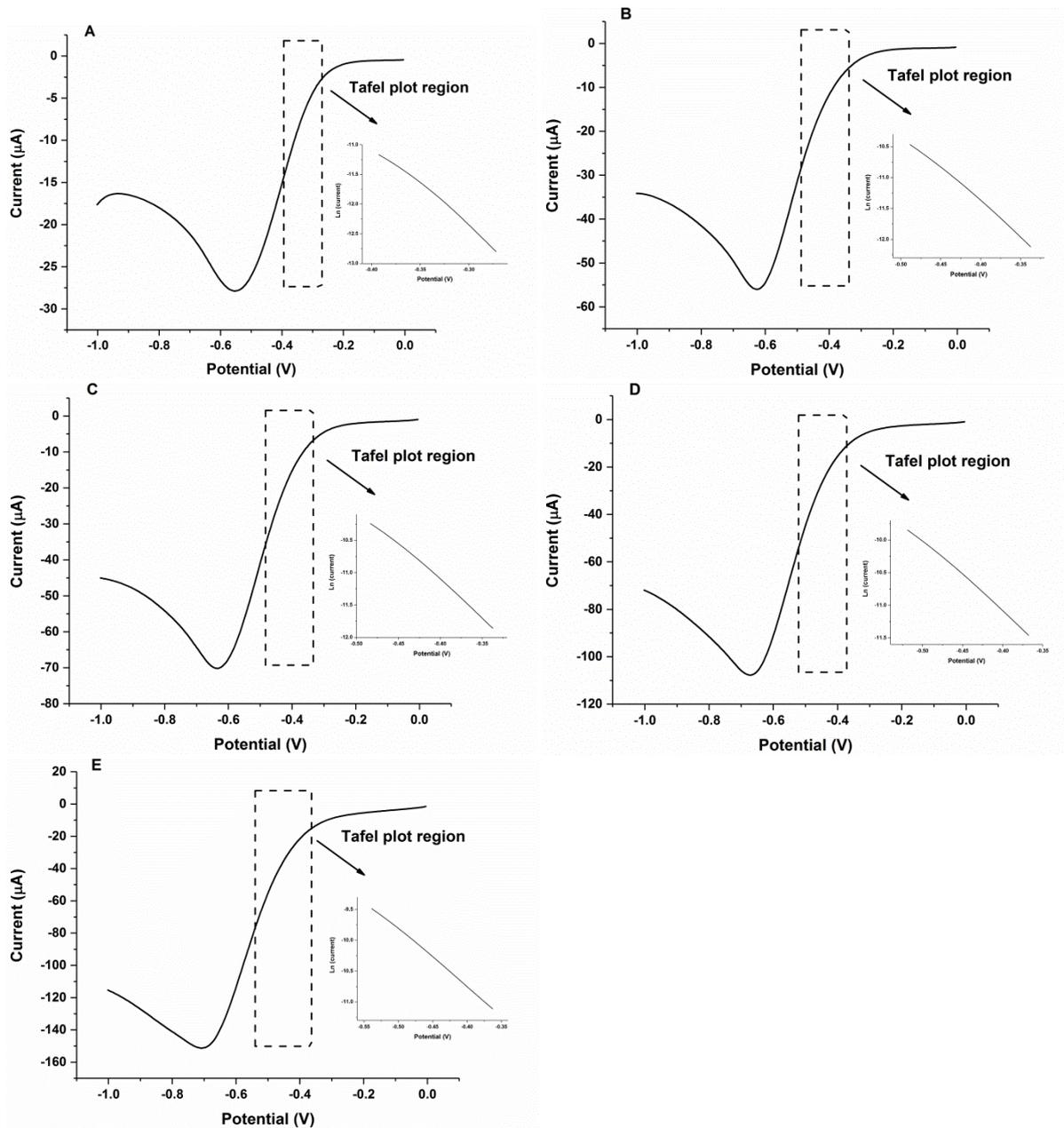


Figure S3. Tafel plots for AgNPs-BDDE in air-saturated PBS solution recorded at different scan rates of 0.01 V s^{-1} (A), 0.025 V s^{-1} (B), 0.05 V s^{-1} (C), 0.1 V s^{-1} (D), and 0.2 V s^{-1} (E).

Table S2. The measured transfer coefficient ($\alpha = 0.28 \pm 0.03$) according to the Tafel slopes from 0.01 to 0.2 V s⁻¹ for AgNPs-BDDE in air-saturated PBS solution.

Scan rate (V s ⁻¹)	Tafel slope	α	α (average)
0.01	-13.13 ± 0.74	0.34 ± 0.019	0.28 ± 0.03
0.025	-11.32 ± 0.31	0.29 ± 0.0079	
0.05	-10.62 ± 0.63	0.27 ± 0.016	
0.1	-10.57 ± 0.19	0.27 ± 0.0049	
0.2	-9.55 ± 0.18	0.25 ± 0.0045	