

## Supporting Information

### Mechanistic Insight into Sulfide-Enhanced Oxygen Reduction Reaction Activity and Stability of Commercial Pt Black: an *in situ* Raman Spectroscopic Study

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#### Supporting Figures:

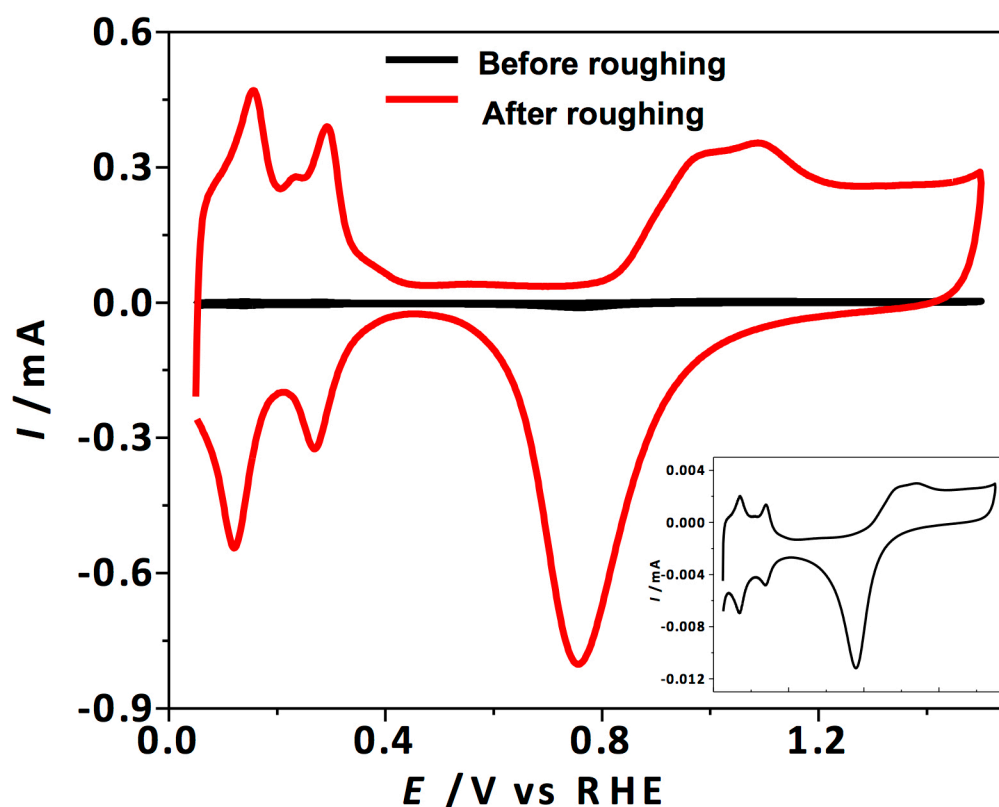
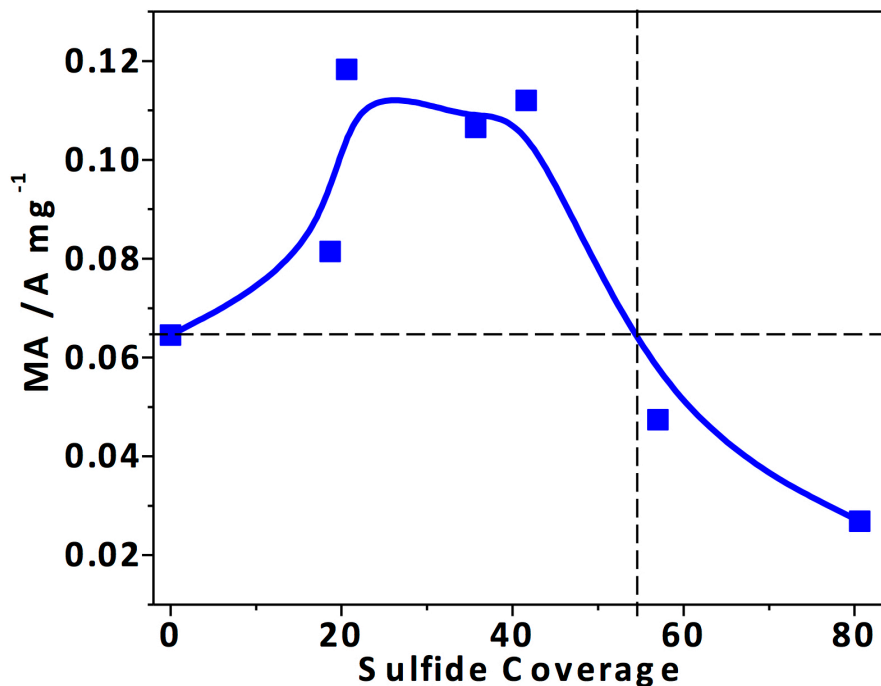
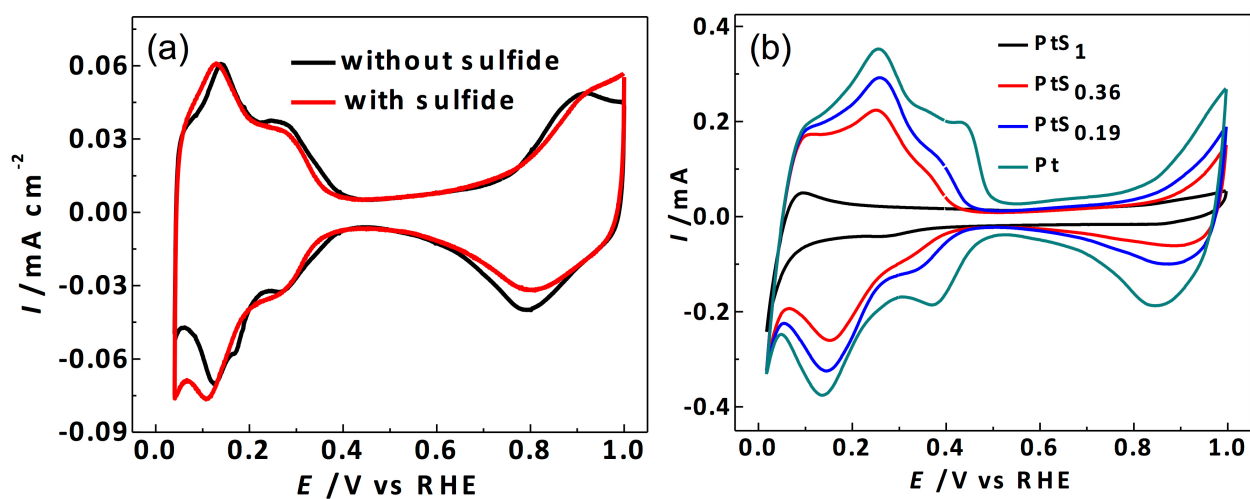


Figure S1

**Figure S1.** CVs of the roughened Pt disk in 0.5 M H<sub>2</sub>SO<sub>4</sub> before (black) and after (red) roughening. The inset is the zoom view of CV before roughening. For detailed roughening procedure, please see Xu, et al. [1].



**Figure S2.** The sulfide coverage dependent ORR mass specific activity measured at 0.9 V.



**Figure S3.** (a) A comparison of the initial CVs in Figure 1(a) and 1(c) normalized by the available Pt surface areas calculated by the average hydrogen adsorption and desorption charges.

(b) CVs of roughened Pt with different sulfide coverage obtained in the Raman flow cell, in Ar-saturated 0.1 M HClO<sub>4</sub> at 50 mV s<sup>-1</sup>.

## References

- (1) Xu, B.; Park, I.-S.; Li, Y.; Chen, D.-J.; Tong, Y. Y. J. *J. Electroanal. Chem.* **2011**, 662, 52–56.