Supporting Materials for

On the Mechanism of the Direct Pathway for Formic Acid Oxidation

at Pt Electrode

Jie Xu, Daofu Yuan, Fan Yang, Dong Mei, Zunbiao Zhang and Yan-Xia Chen[*]

Hefei National Laboratory for Physical Science at Microscale and Department of Chemical

Physics, University of Science and Technology of China, Hefei, 230026, China
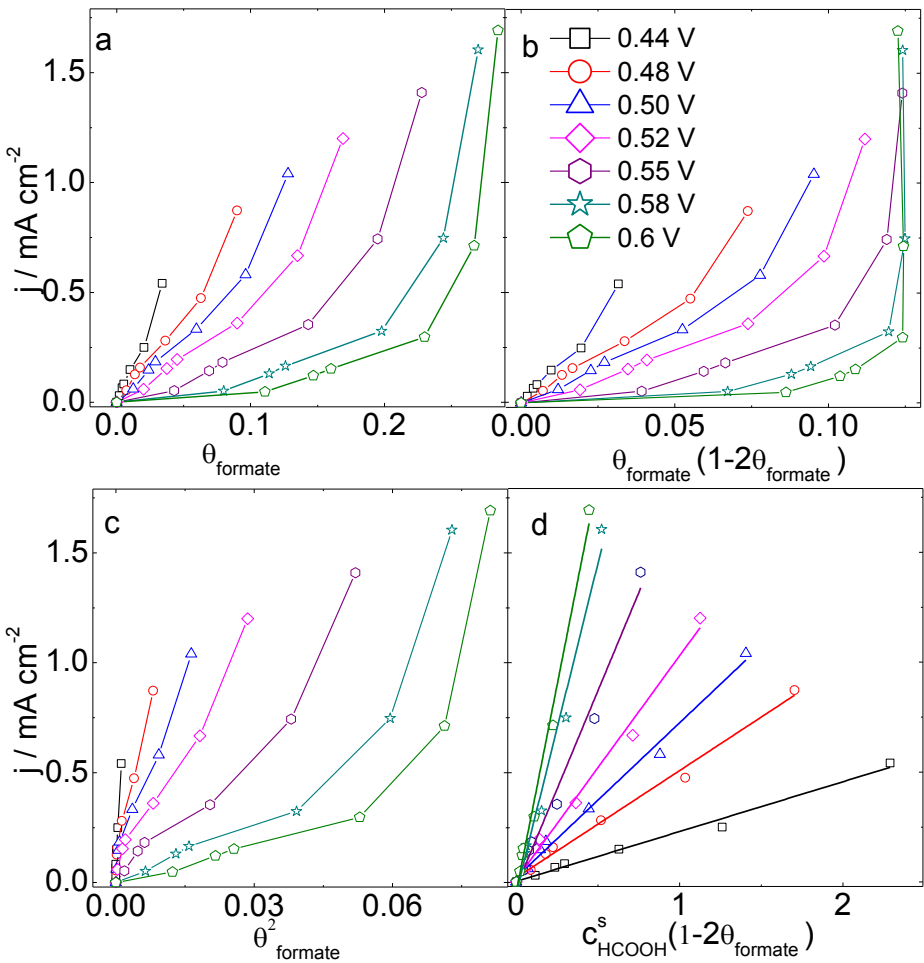
yachen@ustc.edu.cn

Fig. S1 Current density j_{ox} for HCOOH oxidation at some selected potentials from 0.44 V to 0.6 V recorded during the positive-going potential scan with a scan rate of 50 mV/s as a function of (a) $\theta_{formate}$, (b) $\theta_{formate}(1-2\theta_{formate})$, (c) $\theta_{formate}^2$, and (d) $c_{HCOOH}^s(1-2\theta_{formate})$. Note the data point with c_{HCOOH}=10 mM given in Fig. 7d is from ref. 1.[1]

From the figure it is clearly seen that there is no simple linear relationship between the mesured faradaic current density with $f(\theta)$ based on the first and second order formate pathway mechanism proposed previously by ref.1 and 2,3.[1-3]

References

1. V. Grozovski, F. J. Vidal-Iglesias, E. Herrero and J. M. Feliu, *Chemphyschem*, 2011, **12**, 1641-1644.

2. M. Osawa, K.-i. Komatsu, G. Samjeske, T. Uchida, T. Ikeshoji, A. Cuesta and C. Gutierrez, *Angew. Chem. Int. Ed.*, 2011, **50**, 1159-1163.

3. A. Cuesta, G. Cabello, M. Osawa and C. Gutierrez, *Acs Catalysis*, 2012, **2**, 728-738.