Supporting Information for:

# Inkjet-printed Porphyrinic Metal-Organic Framework Thin Films for Electrocatalysis

**Chun-Hao Su, Chung-Wei Kung, Ting-Hsiang Chang, Hsin-Che Lu, Kuo-Chuan Ho*, and Ying-Chih Liao***

Department of Chemical Engineering, National Taiwan University, Taipei, Taiwan

*#1 Sec. 4 Roosevelt Rd., Taipei, Taiwan, e-mail: liaoy@ntu.edu.tw

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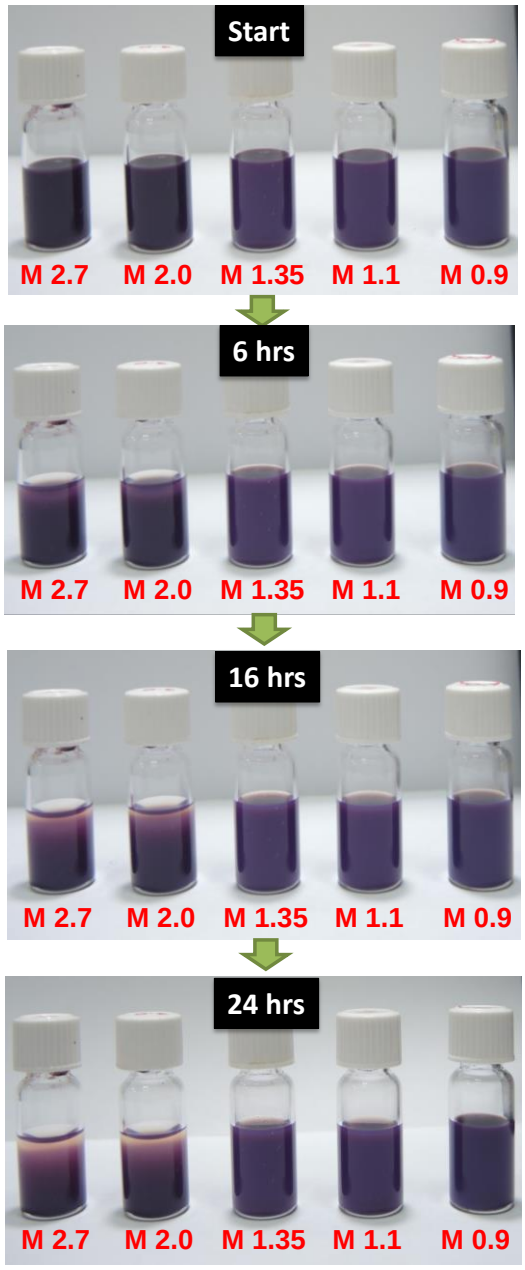


**Fig. S1**. Stability tests for MOF-525 inks with M2.7, M2.0, M1.35, M 1.1 and M0.9: sedimentation process of MOF-525 crystals dispersed in DMF under regular gravity. All samples have the same concentration of MOF-525 crystals (10 mg/mL) and were placed in a sonication bath for half an hour before the test.

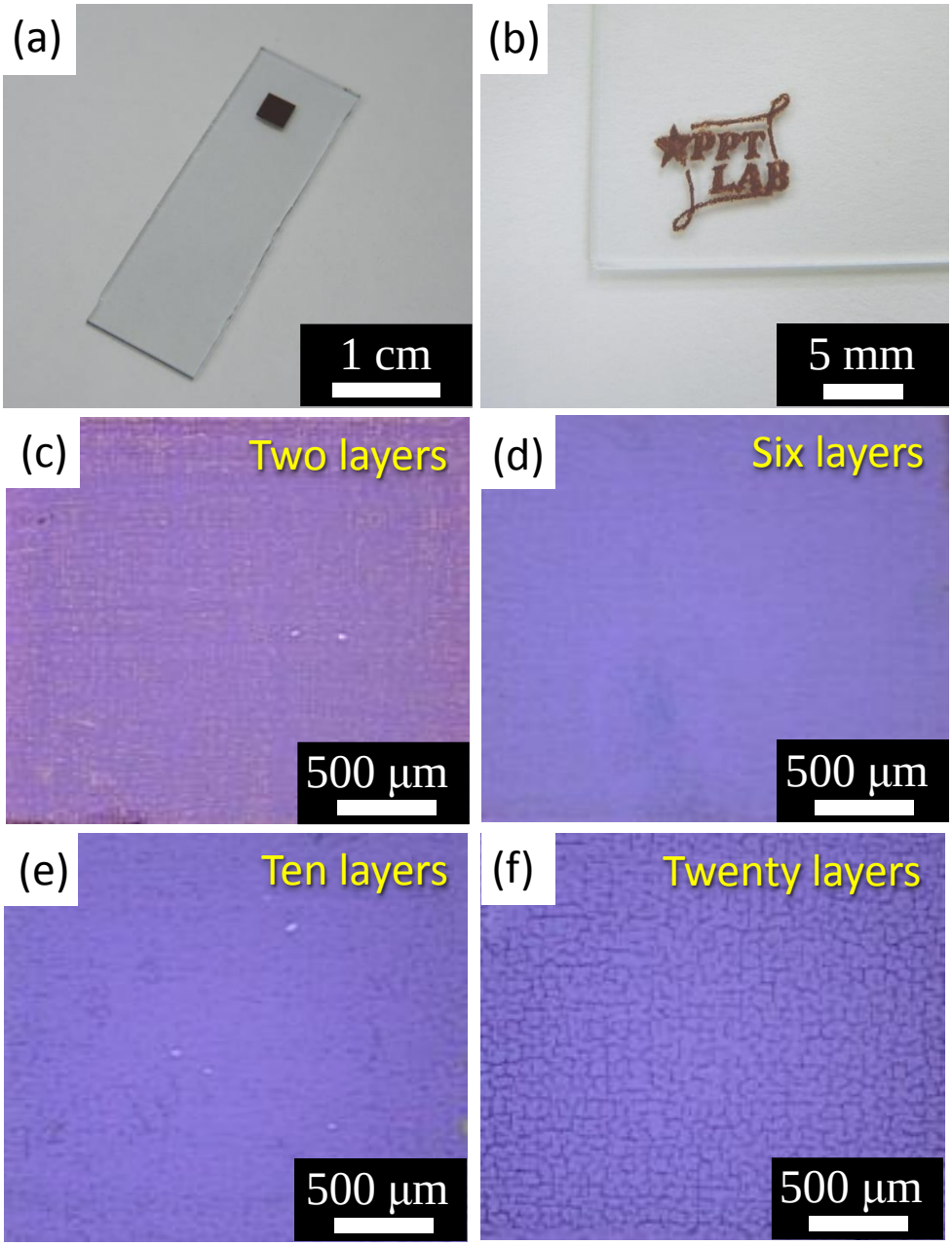


**Fig. S2.** (a)Photo of the inkjet-printed M1.35 thin film after printing for six layers on the ITO glass.(b) Photo of the inkjet-printed M1.35 thin film pattern on the ITO glass. Optical microscopic images of M1.35 thin films after printing for (c) two layers, (d) six layers, (e) ten layers, and (f) twenty layers.

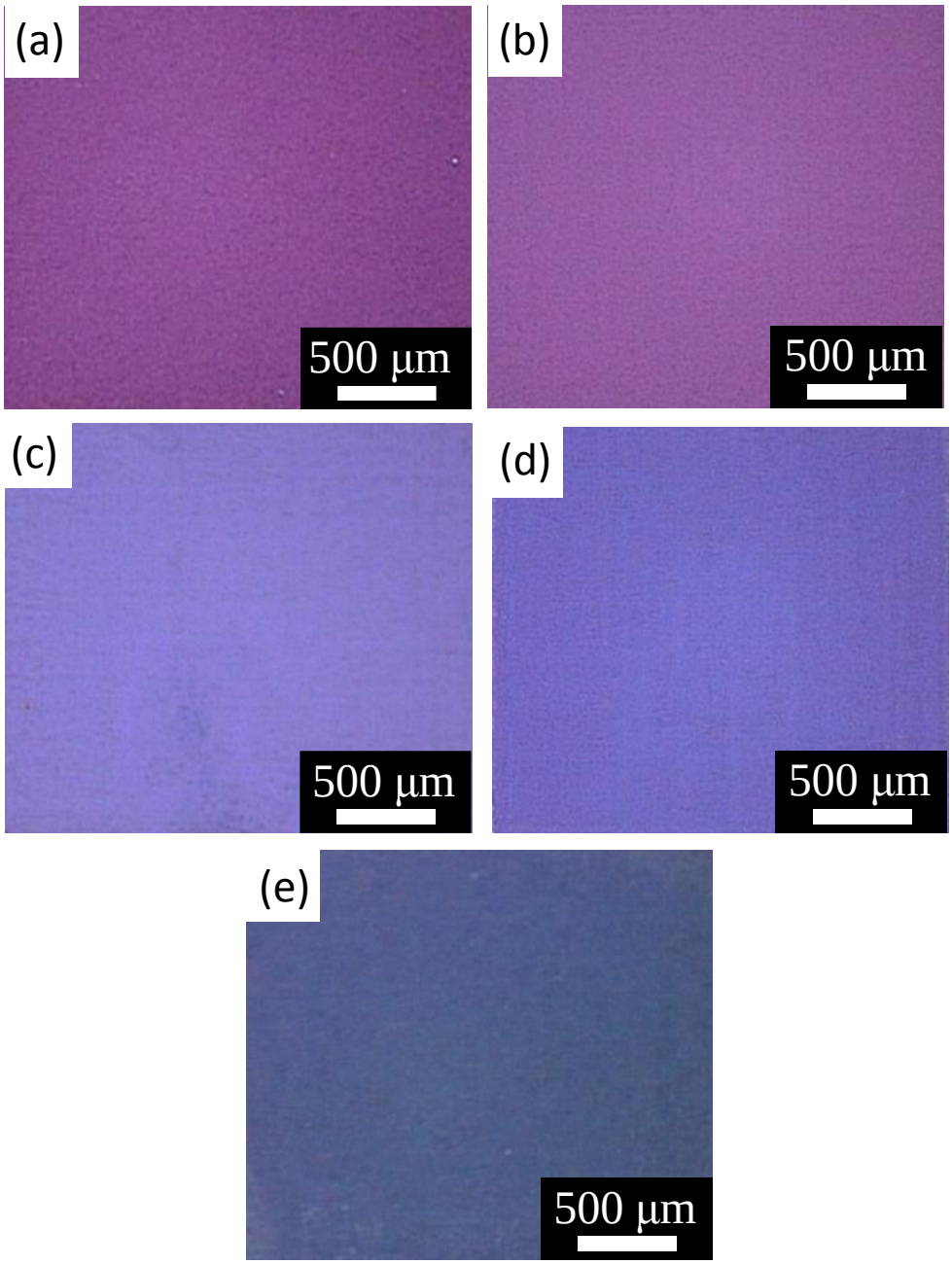


**Fig. S3.** Optical microscopic images of the inkjet printed (a) M 2.7, (b) M 2.0, (c) M1.35, (d) M1.1, and (e) M0.9 thin films with six layers of printing.

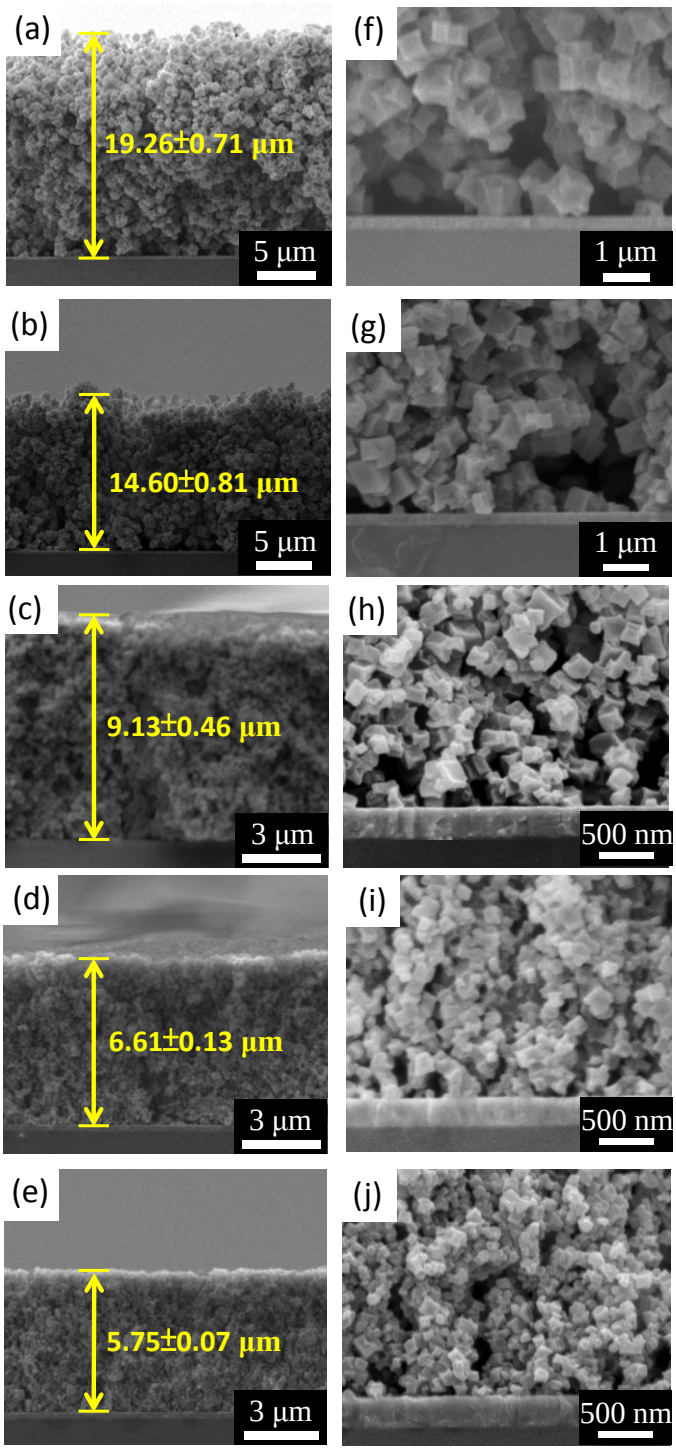


**Fig. S4.** Cross-section SEM images of the (a) M2.7, (b) M2.0, (c) M1.35, (d) M1.1, and (e) M0.9 thin films at low magnification, and (f) M2.7, (g) M2.0, (h) M1.35, (i) M1.1, and (j) M0.9 thins film at high magnification.

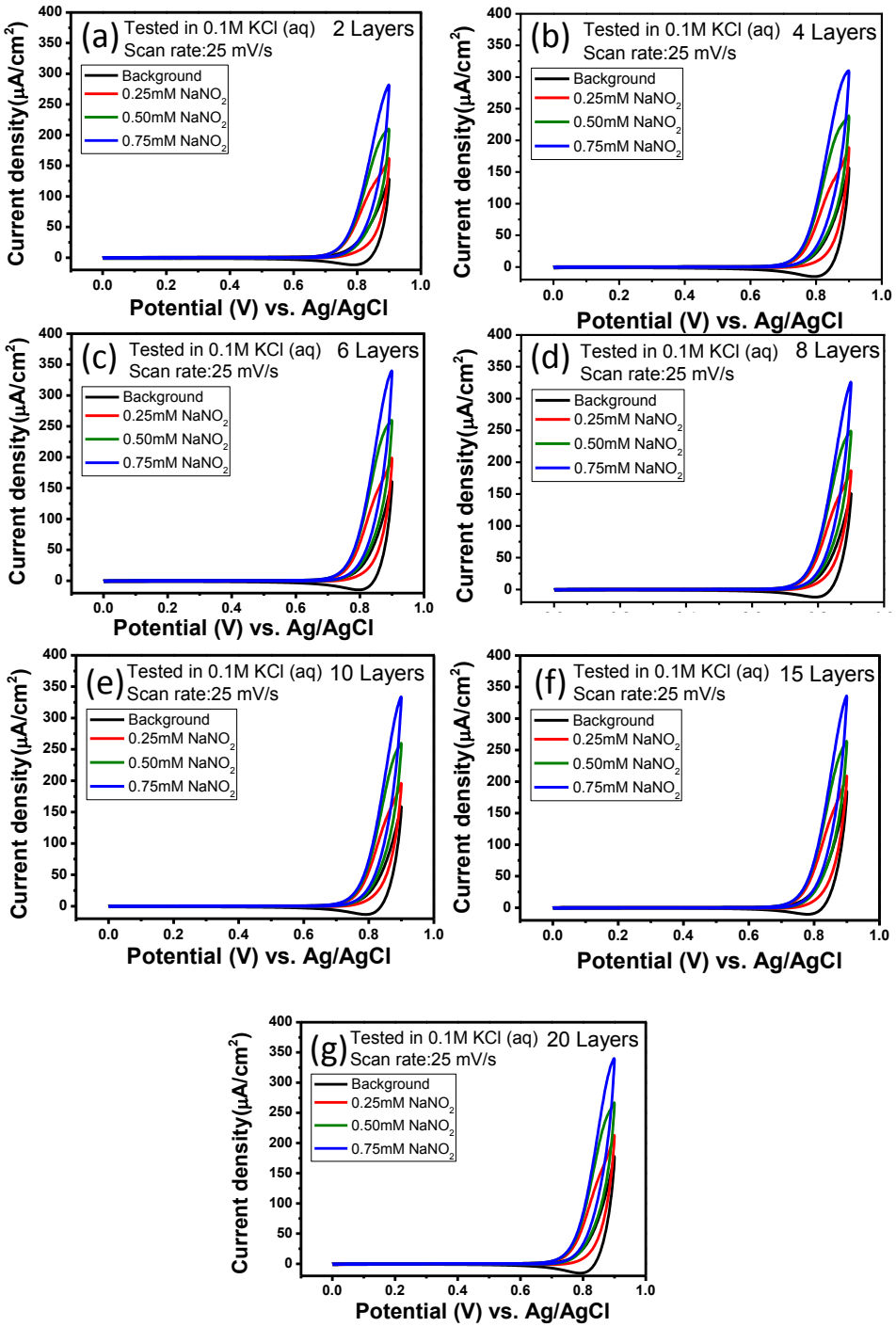


**Fig. S5.** CV curves of the M1.35 thin films with (a) two layers, (b) four layers, (c) six layers, (d) eight layers, (e) ten layers, (f) fifteen layers, and (g) twenty layers, measured in 0.1 M KCl solutions containing various concentrations of nitrite.

We used the Griess reagent to calibrate the nitrite concentration with spectrophotometer (Fig. S6 (a)). Then, the M1.1 thin film was used in an amperometric test at 0.85 V in stationary 0.1 M KCl containing 30 μM of nitrite for 1 hour. The total volume of test fluid was 5 mL. After the electro catalytic reaction, we found the absorbance at 523 nm declined from 0.3585 to 0.3495, indicating a nitrite concentration decline from 30.04 μM to 29.098 μM. From the charge amount supplied ($1.68 \times 10^{-3}$ C), the Faradaic efficiency is calculated to be about 54%.

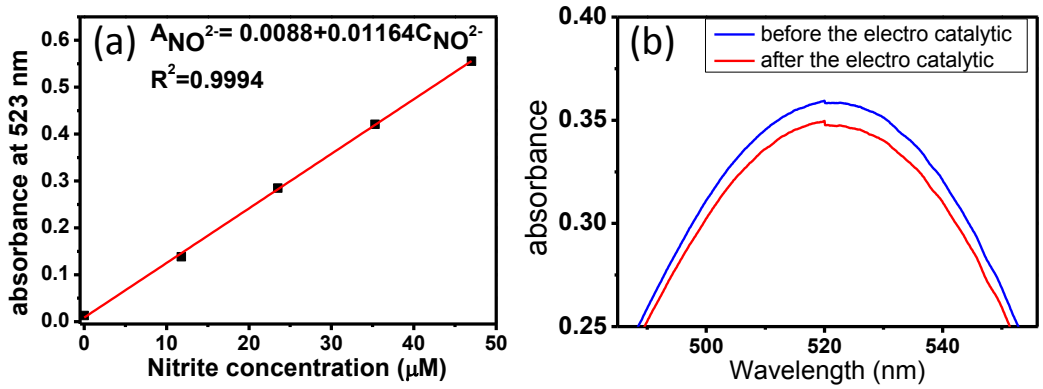


**Fig. S6.** (a) the Griess reagent to calibrate the nitrite concentration with spectrophotometer. (b) the absorbance for nitrite concentration before and after electro catalytic

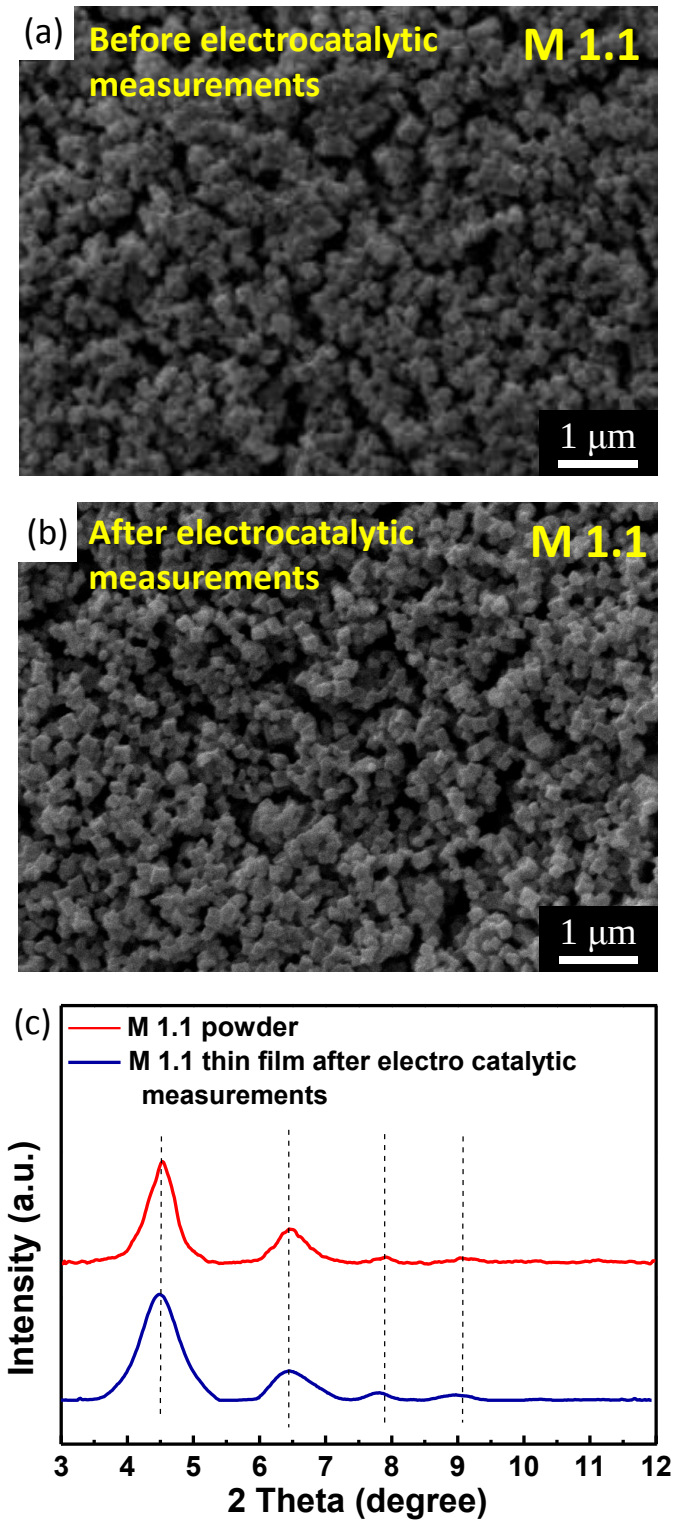


**Fig. S7.** SEM images of the M1.1 thin film (a) before and (b) after the CV tests.(c) XRD patterns of M1.1 powder and after the CV test.

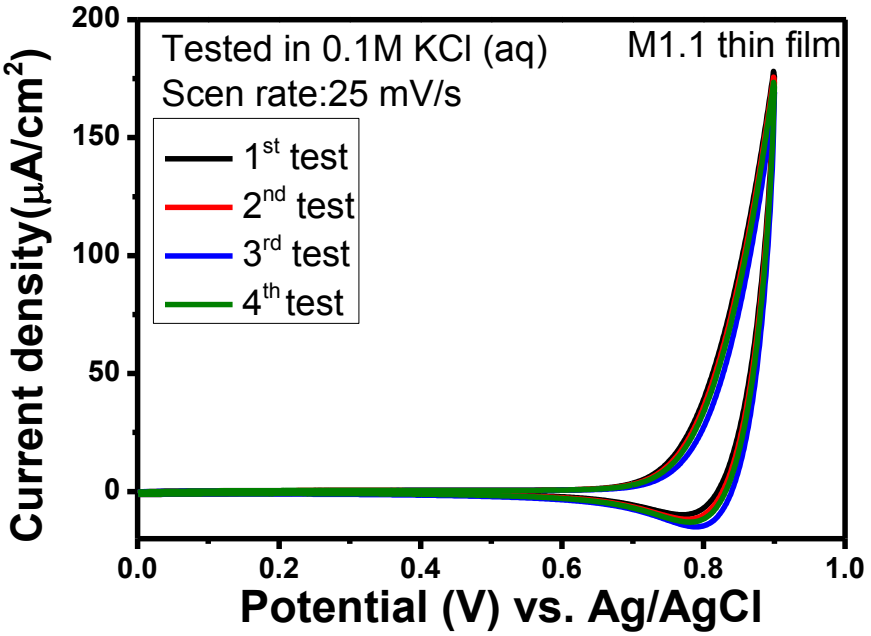


**Fig. S8.** Recyclability test for M1.1 thin film by CV test