Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Supplementary Information

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1. Bending test

Fig. R1 shows the variation of I-V parameters of the flexible QDSSC with bending 0-20 times. It can be seen that J_{sc}, V_{oc}, FF and PCE values continuously decreased with bending times compared to the fresh cells. The reduced PCE value of QDSSC upon bending is attributed to the loss of light absorption, which reflected by the decreased value of J_{sc}. Meanwhile, the contact between Pt and electrolyte is becoming non-uniform, subsequently decreasing the efficiency of redox reaction in the electrolyte.

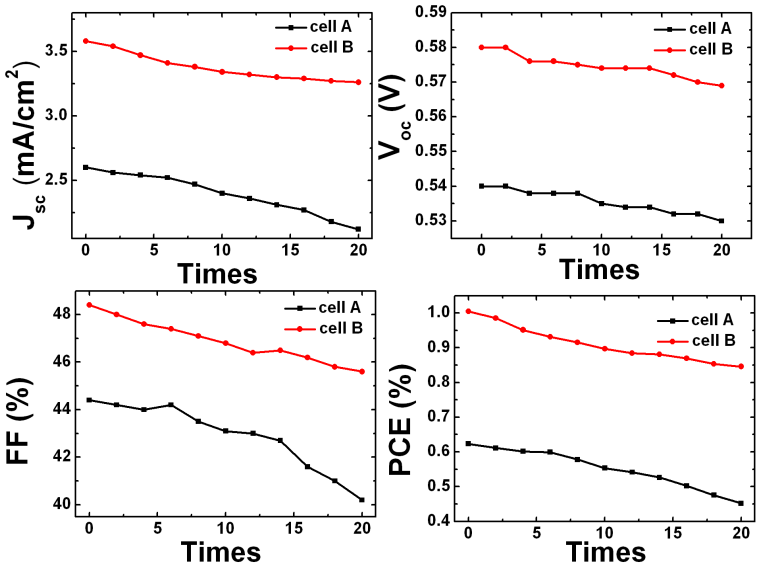

Fig. S1 The variation of I-V parameters of the flexible QDSSC with bending 0-20 times

2. Stability test

Fig. S1 shows the variation in the I-V parameters of the flexible QDSSC with and without ZnS coating layer. It can be seen that the flexible QDSSC has a longer stable time with ZnS coating layer. The PCE degradation for the flexible QDDSC with ZnS coating layer is reduced by 34%, which is slower than that without ZnS coating layer (57%). Therefore, it is proved that the ZnS coating layer can help improve the stability of the cell due to the significantly reduced charge recombination in QDSSC.

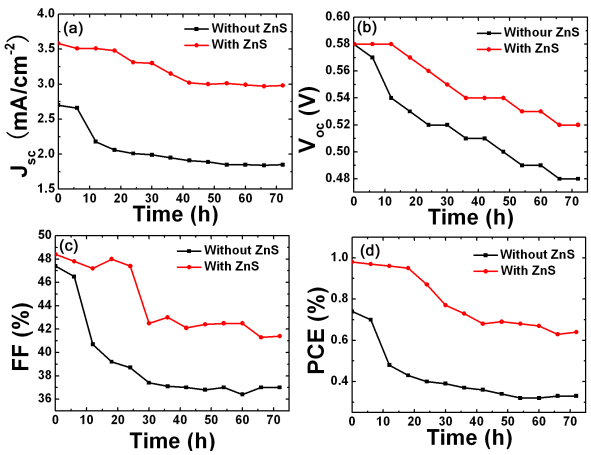

Fig. S2 The variation in the I-V parameters of sealed devices with and without ZnS coating layer during 96 h

3. Counter electrode bending test

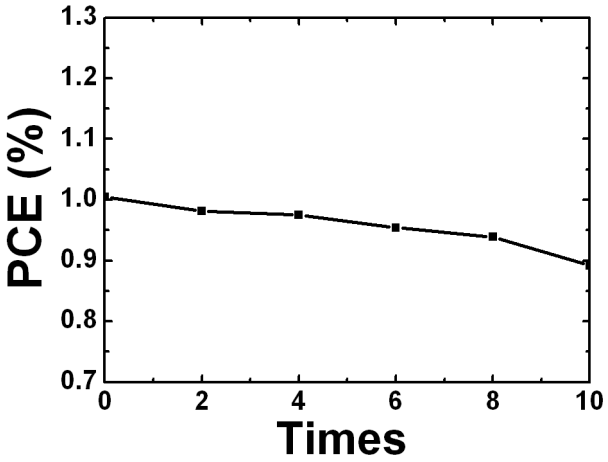

Fig. S3 The performance of the flexible QDSSC after counter-electrode bending 0-10 times.

Fig. S3 shows the performance of the flexible QDSSC after counter-electrode bending 0-10 times. I-V curve for this QDSSC is a little reduced compared to the QDSSC with the un-bended counter-electrode. Therefore, the loss of PCE is related to the bending of the counter electrode.

4. EIS test analysis

Table S1 the values of R_s, R_r and R_{ct} obtained from the equivalent circuit

Applied voltage (V)	R_s (Ω)	R_r(Ω)	R_{ct}(Ω)
30	42.20	319.8	144.96
35	46.06	391.6	119.2
40	42.22	527.2	111.32
45	39.68	660.8	108.4
50	49.20	610.4	166.4