

## **SUPPORTING INFORMATION**

### **Unlocking Efficient Overall Water Splitting Reactions on Sulphur-Doped Carbon dot Electrocatalysts**

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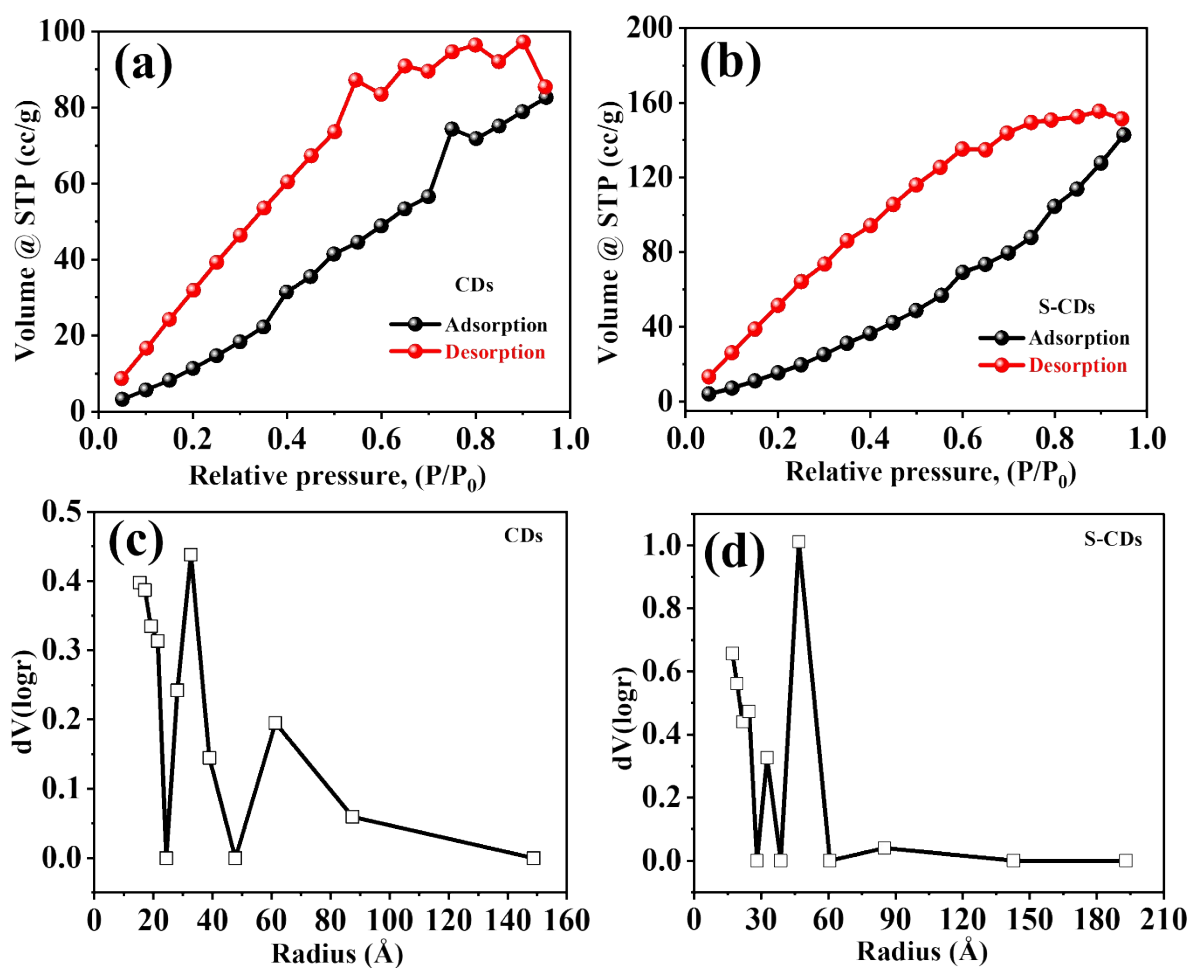
**S6: Repeatability for HER**

**S7: Concentration, pH dependent studies and i-t measurements for OER**

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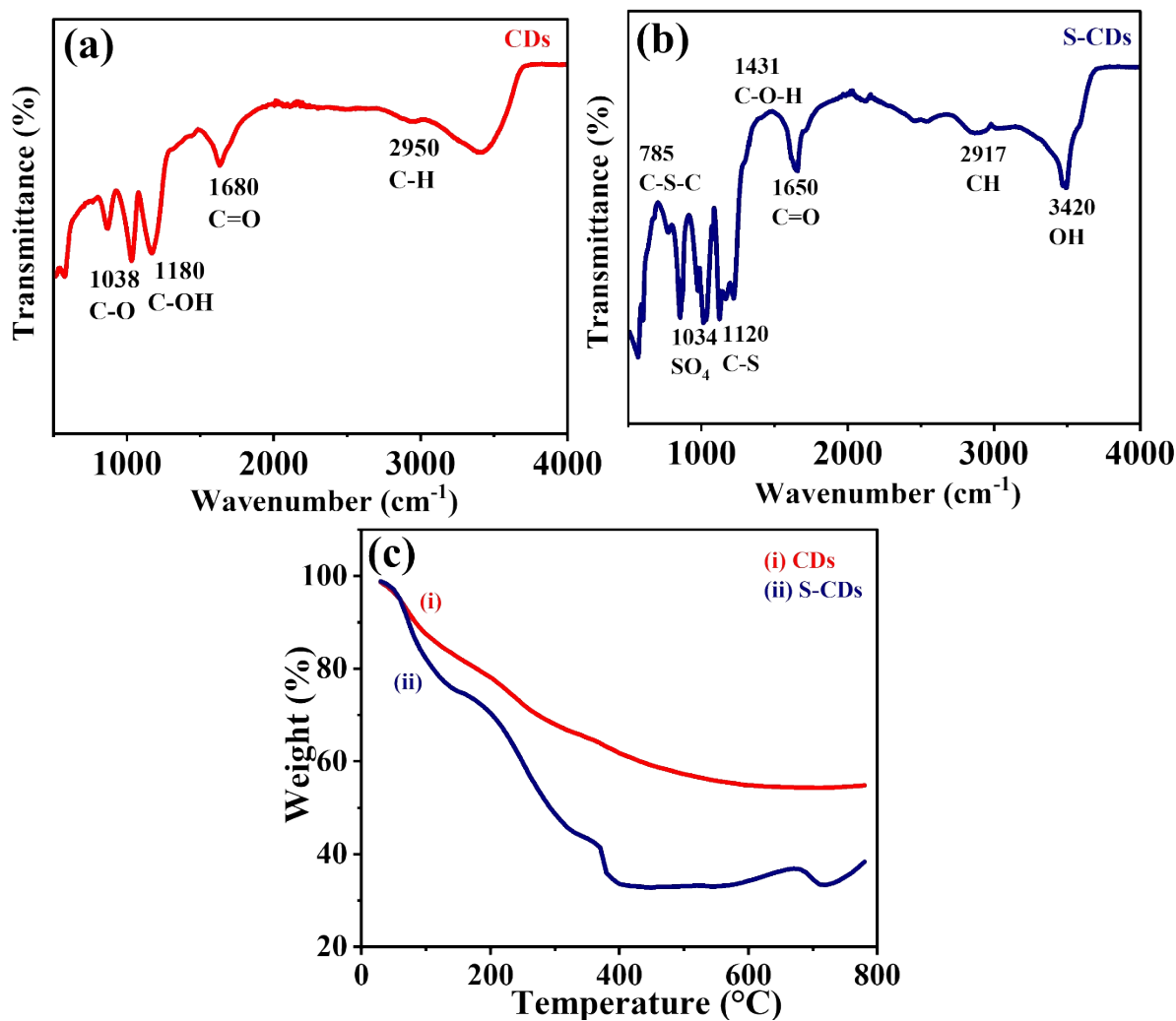
**S9: Repeatability for OER**

### S1: BET surface area measurement studies:



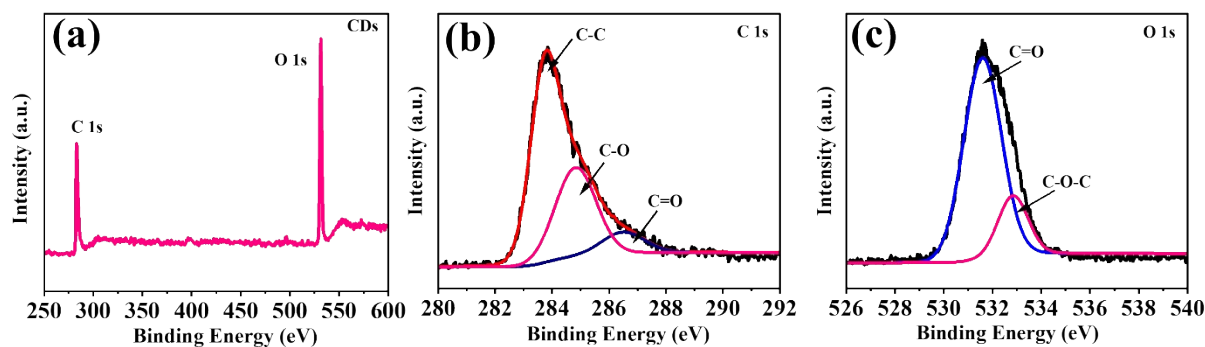
**Fig S1:** Brunauer–Emmett–Teller (BET) surface area analysis having (a) N<sub>2</sub> adsorption-desorption isotherms of (a) CDs (b) S-CDs and BJH pore size distribution of (c) CDs (d) S-CDs.

### S2: FTIR and TGA Analysis:



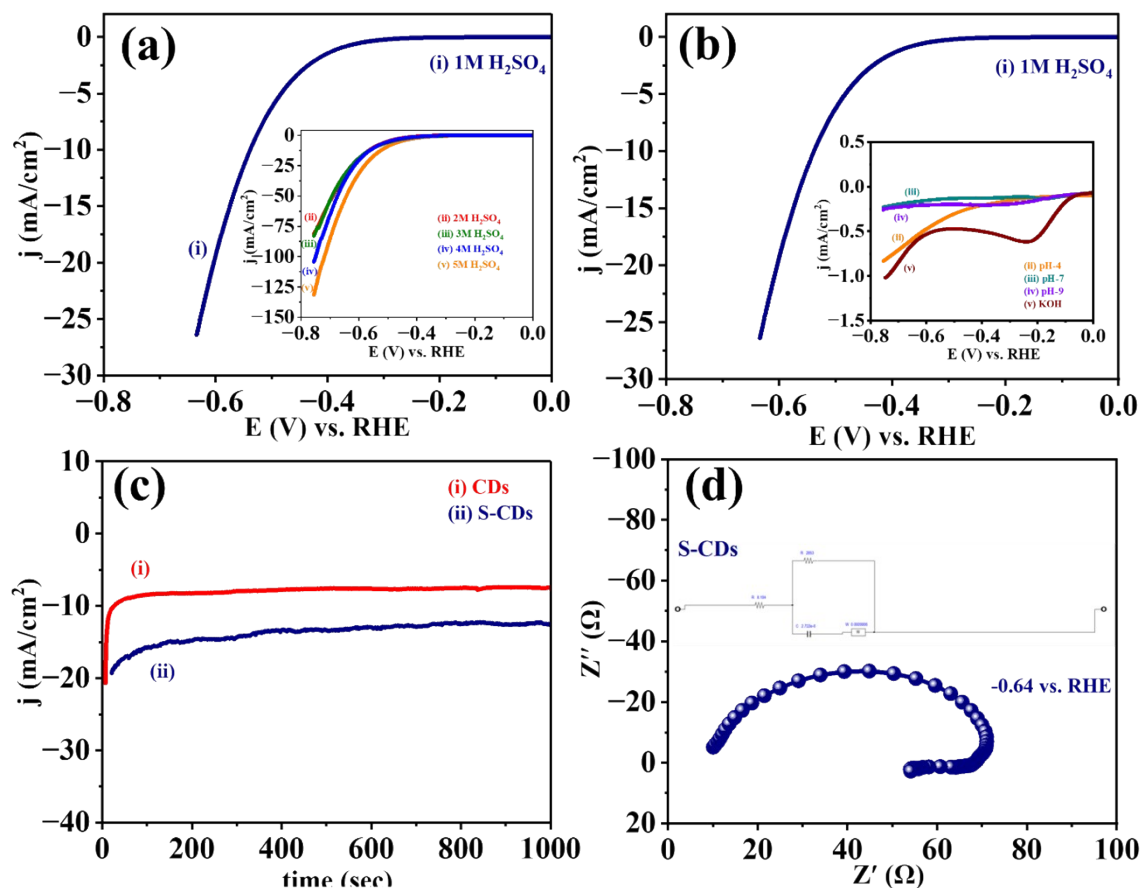
**Fig S2:** (a) FTIR CDs (b) FTIR S-CDs and (c) TGA of as synthesized S-CDs compared with CDs.

### S3: X-ray Photoelectron Spectroscopy of CDs:



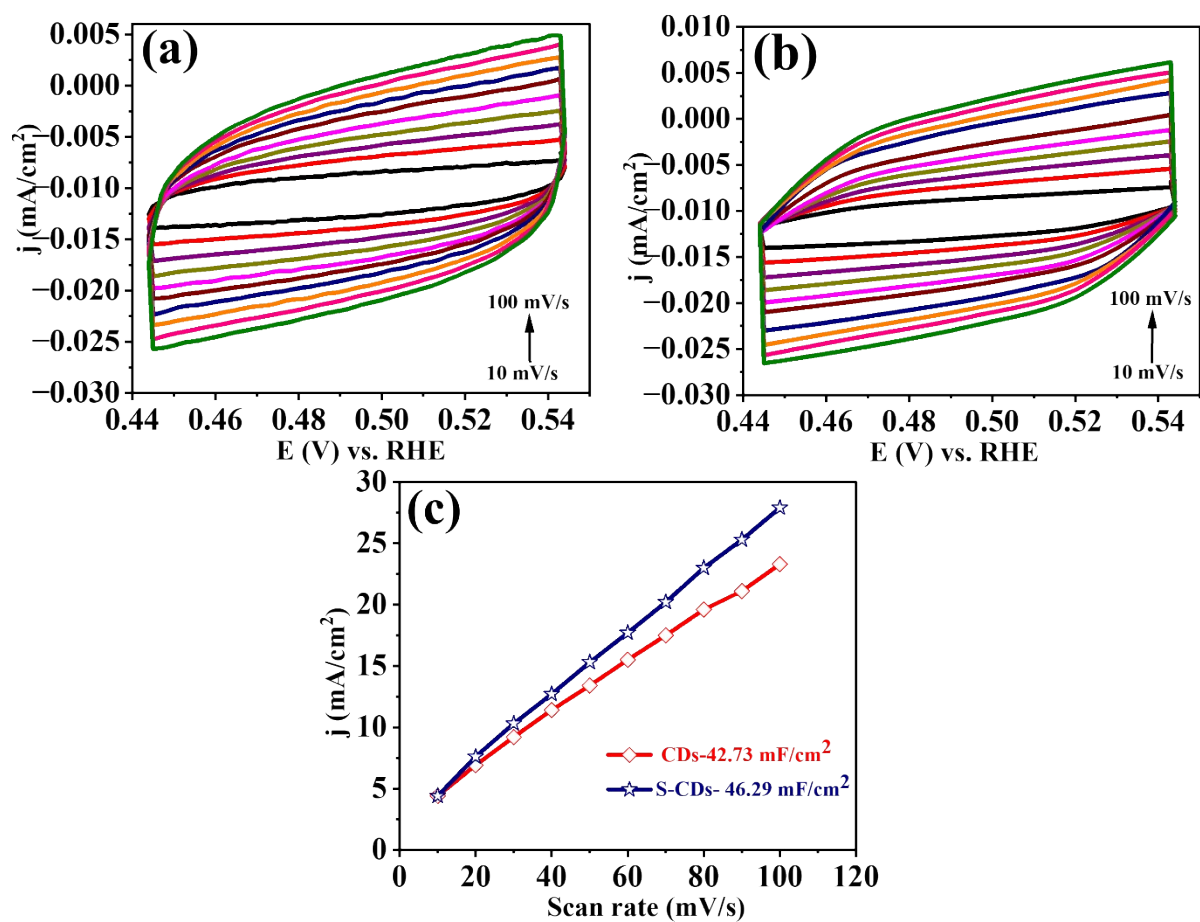
**Fig S3:** (a) Full survey X-ray photoelectron spectra (XPS) of CDs confirms C and O elements, and individual spectra of (b) C1s, represents C-C, C-O, C=O bonding, (c) O1s, indicated C=O, C-O-C.

#### S4: Concentration, pH dependent studies and i-t measurements for HER:



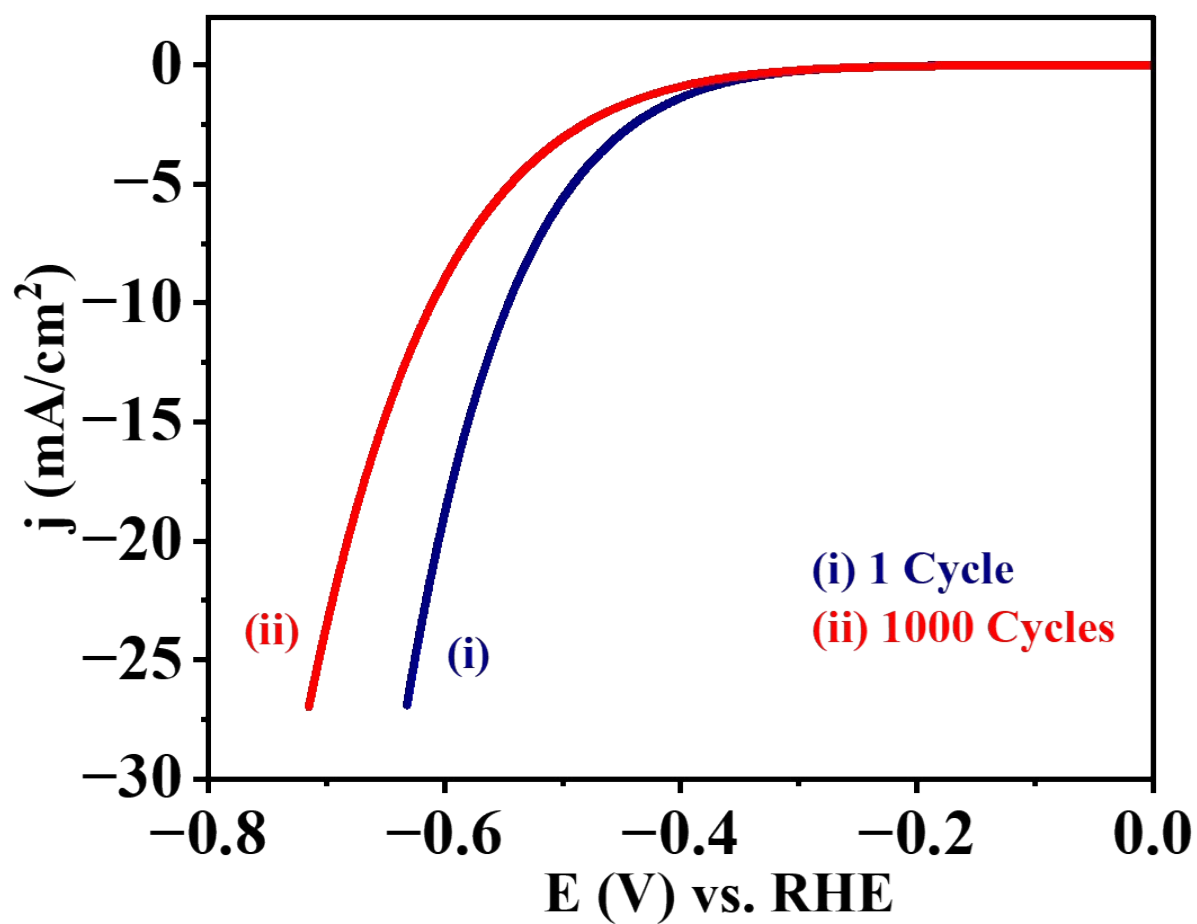
**Fig S4:** (a) Concentration dependent LSV of S-CDs from 1 M to 5 M H<sub>2</sub>SO<sub>4</sub> solutions. (b) pH dependent LSV (c) chronoamperometric (i-t) stability of (i) CDs (ii) S-CDS in 1 M H<sub>2</sub>SO<sub>4</sub> for 1000 sec. (d) EIS (zoom) S-CDs.

#### S5: Electrochemical active surface area (ECSA) and roughness factor for HER:



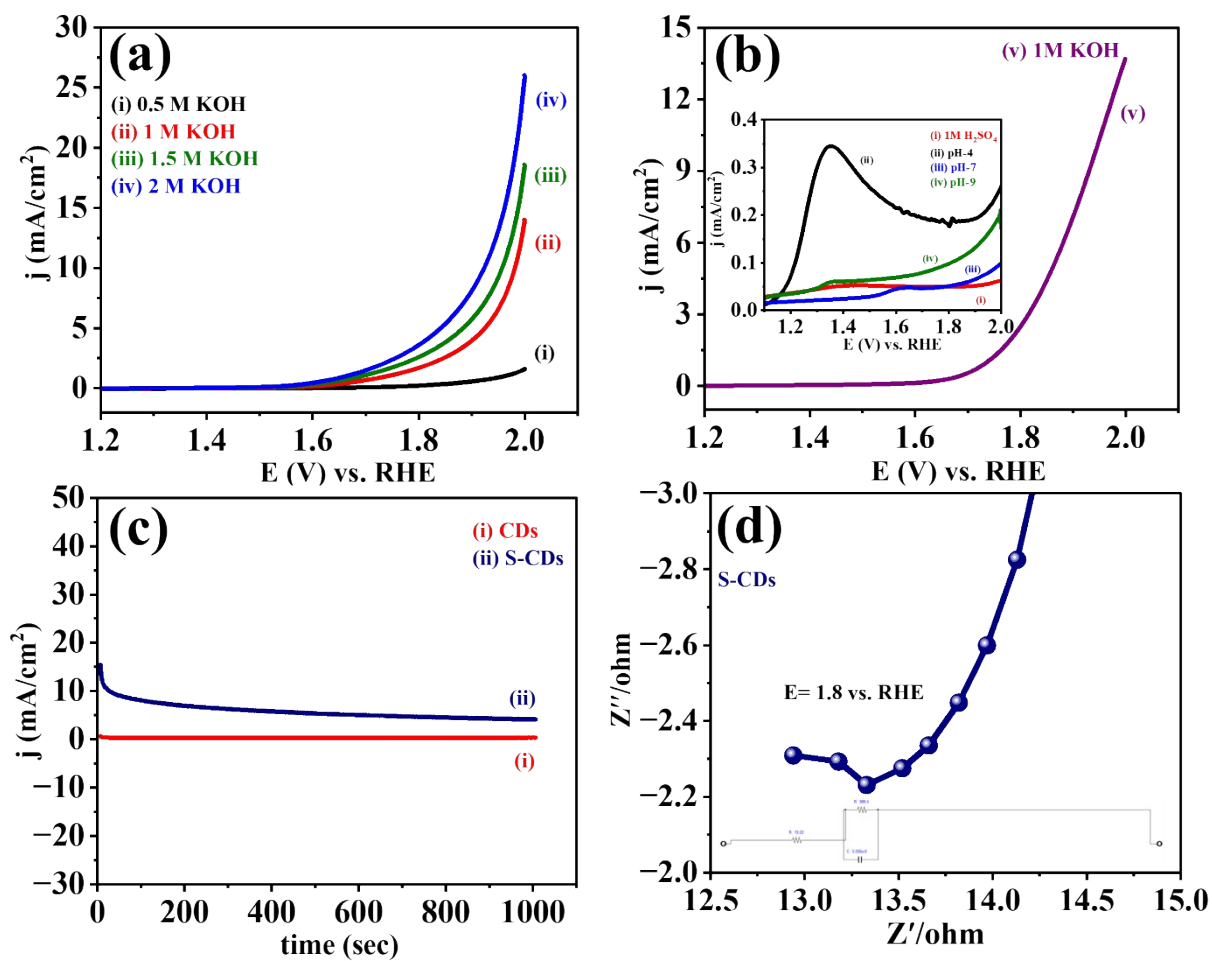
**Fig S5:** Effective electrochemical active surface area tests (ECSA) of (a) CDs (b) S-CDs (c) electrochemical double-layer capacity ( $C_{dl}$ ) of CDs and S-CDs for HER.

#### S6: Repeatability Profile for HER Studies:



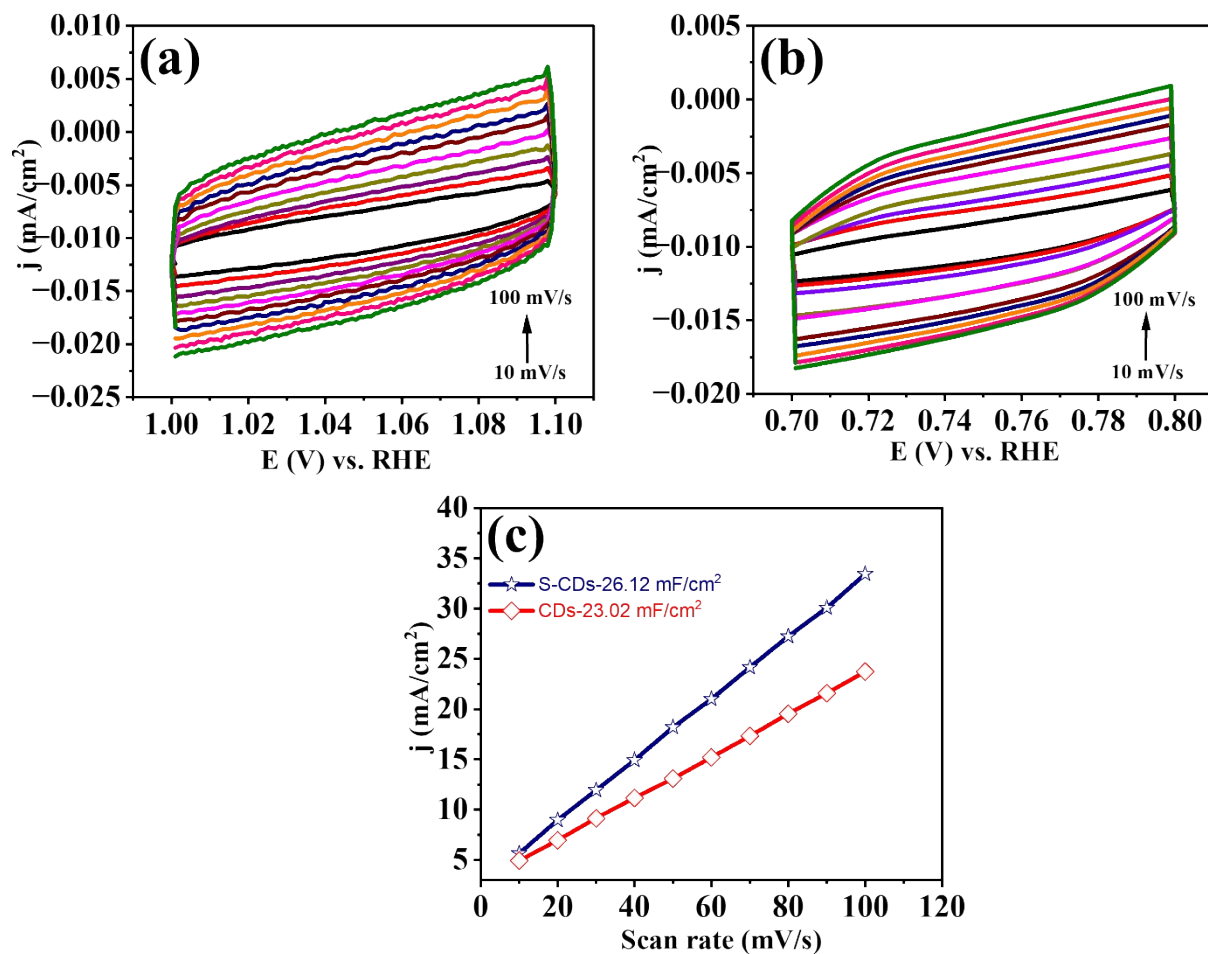
**Fig S6:** Superimposed linear sweep voltammetry (LSV) curves of S-CDs at 1st and 1000th cycles in 1 M H<sub>2</sub>SO<sub>4</sub> solution at a scan rate of 50 mV/s.

**Fig S7:** Concentration, pH dependent studies and i-t measurements for OER Studies:



**Fig S7:** Concentration dependent LSV of S-CDs from 0.5M to 2M KOH solutions. (b) pH dependent LSV (c) chronoamperometric (i-t) stability of (i) CDs (ii) S-CDs in 1M KOH for 1000 sec. (d) EIS (zoom) S-CDs.

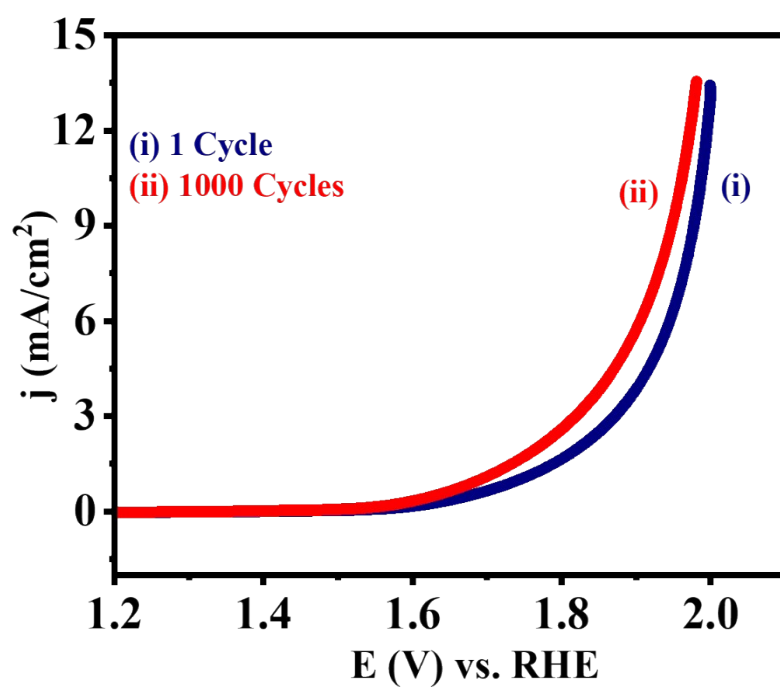
**Fig S8:** Electrochemical active surface area (ECSA) and roughness factor for OER Studies:



**Fig S8:** Effective electrochemical active surface area tests (ECSA) of (a) CDs (b) S-CDs (c) electrochemical double-layer capacity ( $C_{dl}$ ) of CDs and S-CDs for OER.

**Fig S9:** Repeatability for OER Studies:





**Fig S9:** Superimposed linear sweep voltammetry (LSV) curves of S-CDs at 1st and 1000th cycles in 1 M KOH solution at a scan rate of 50 mV/s.