

# Shape Controllable MoS<sub>2</sub> Nanocrystals Prepared by Single Precursor Route for Electrocatalytic Hydrogen Evolution

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## 1. Experiment

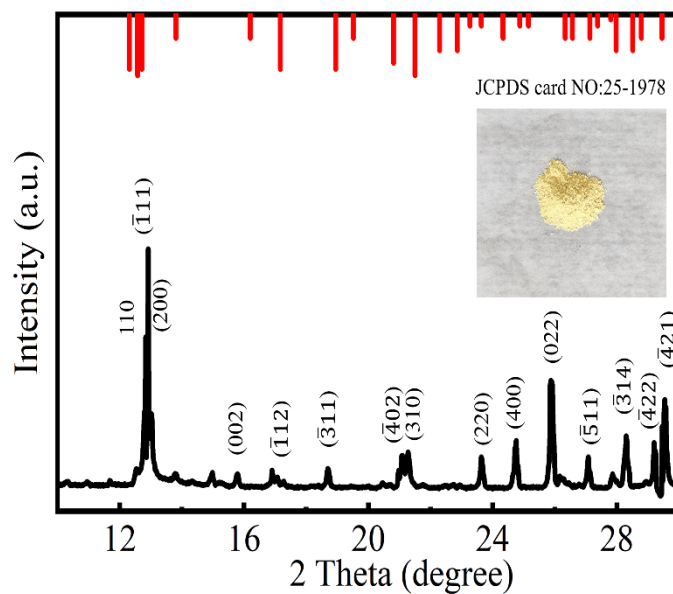
### 1.1 Fabrication of MoS<sub>2</sub> nanorods, nanoribbons, and bulks

**Synthesis of MoS<sub>2</sub> nanorods.** 0.25 mmol of MoDTC (216mg) was added to 1 mL of 1-DDT and 20 mL of 1-ODE. The resulting mixture was heated to 190 °C under nitrogen. The reactants maintain the temperature for 90 min with strong agitation. The subsequent purification procedures were the same as the treatment for MoS<sub>2</sub> QDs.

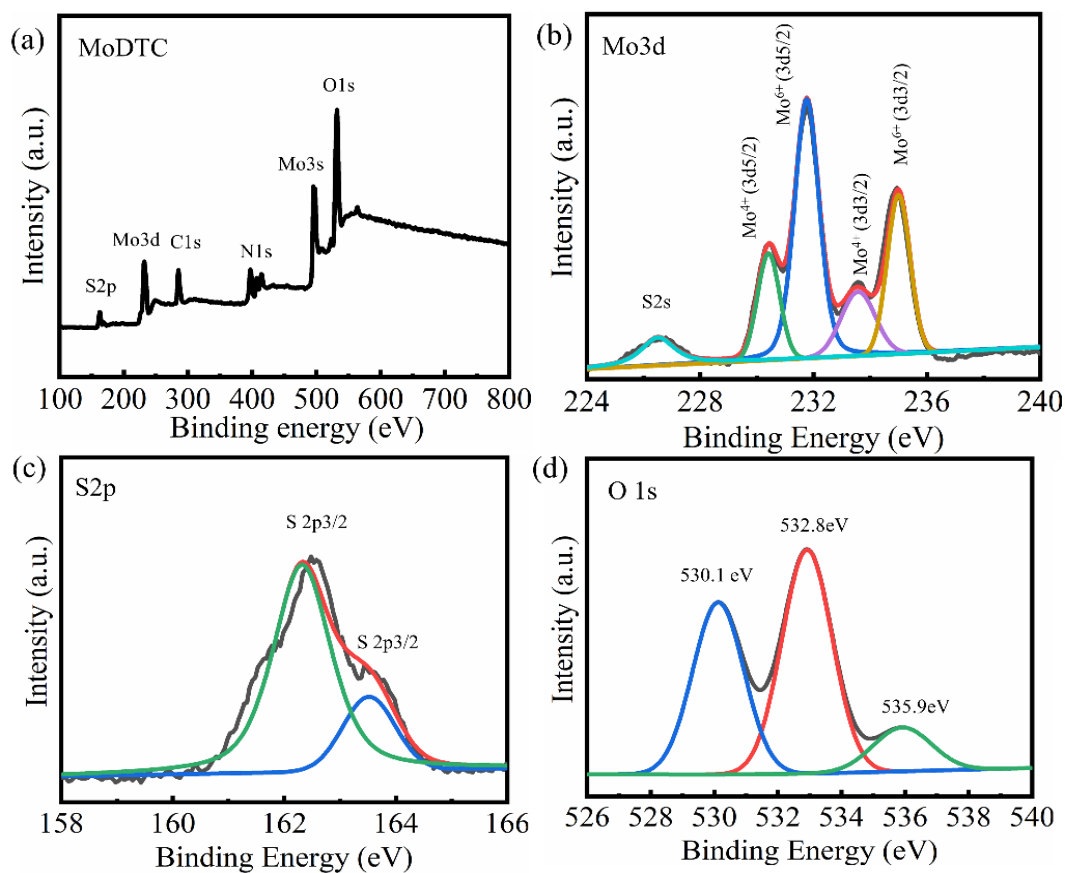
**Synthesis of MoS<sub>2</sub> nanoribbons.** A mixture of 216 mg of MoDTC (0.25 mmol) in 1 mL of 1-DDT and 20 mL of 1-ODE was heated 100°C under nitrogen for 30 min. Subsequently, the mixture was heated to 220 °C and held the temperature for 90 min with strong agitation. The purification process of MoS<sub>2</sub> nanoribbons was identical to the treatment for MoS<sub>2</sub> QDs.

**Synthesis of MoS<sub>2</sub> bulks.** Decomposition of 216 mg of MoDTC (0.25 mmol), in 20 mL of 1-ODE and 1 mL of 1-DDT at 250 °C for 90 min resulted in MoS<sub>2</sub> bulks. The purification process of MoS<sub>2</sub> bulks was the same as the treatment for MoS<sub>2</sub> QDs.

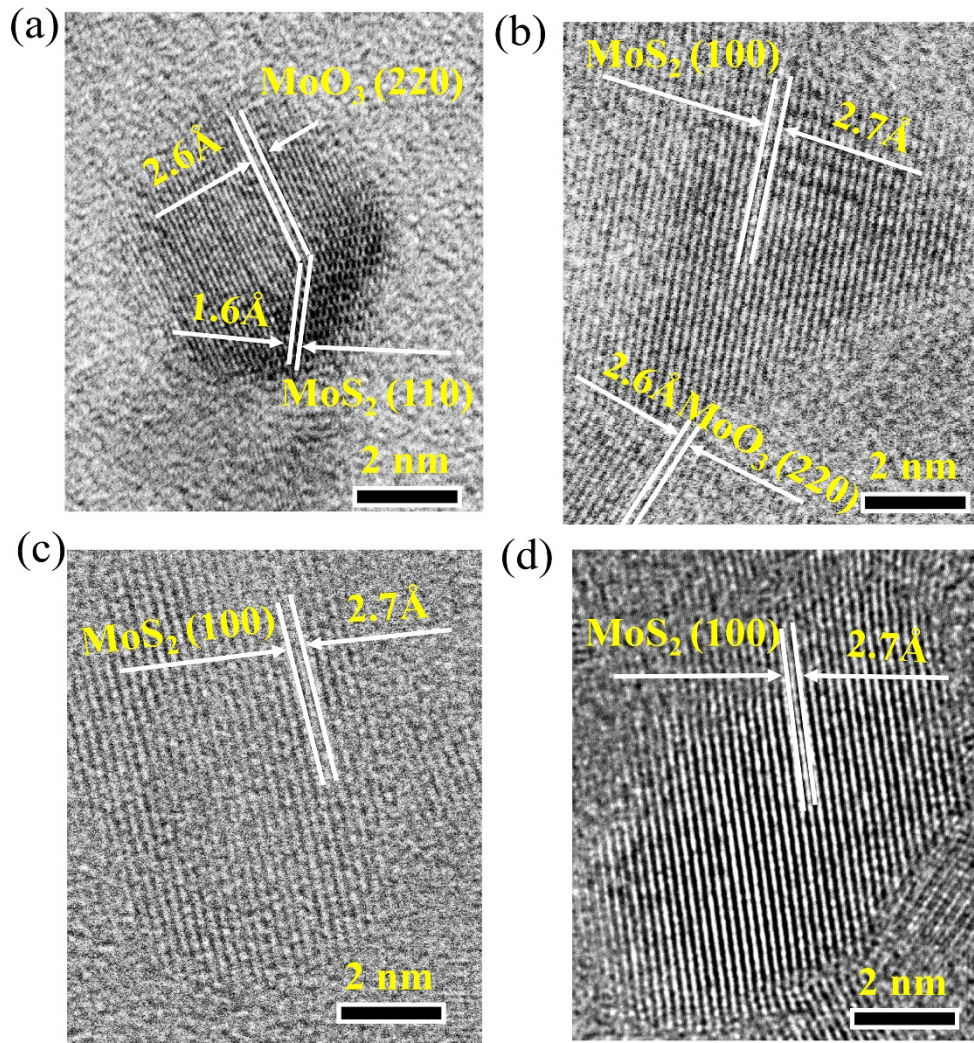
## 2. Additional Figures



**Figure S1.** XRD pattern of the precursor (MoDTC).



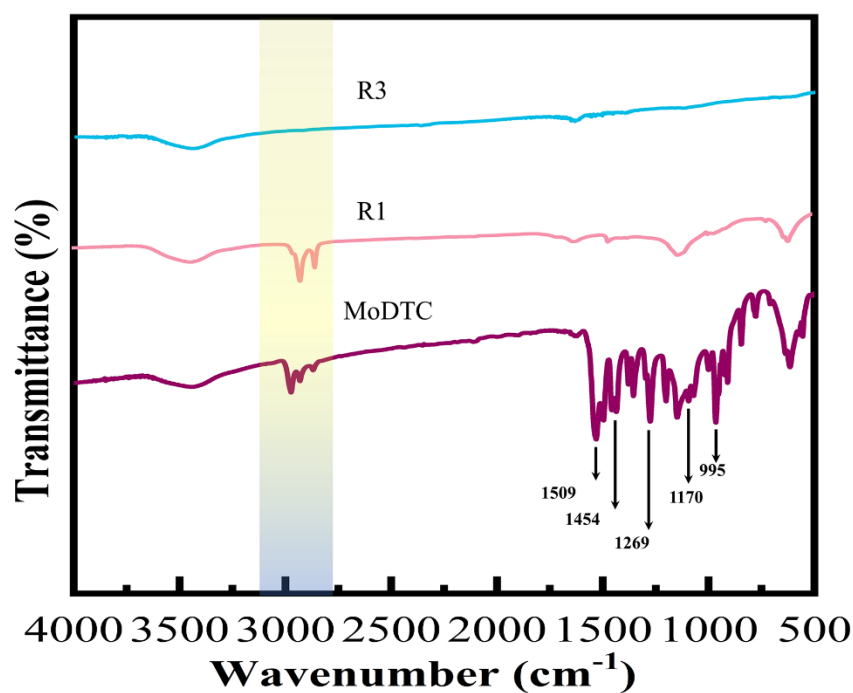
**Figure S2.** (a) Survey XPS patterns of precursor (MoDTC) and high-resolution scans of (b) Mo3d, (c) S2p, and (d) O1s electrons.



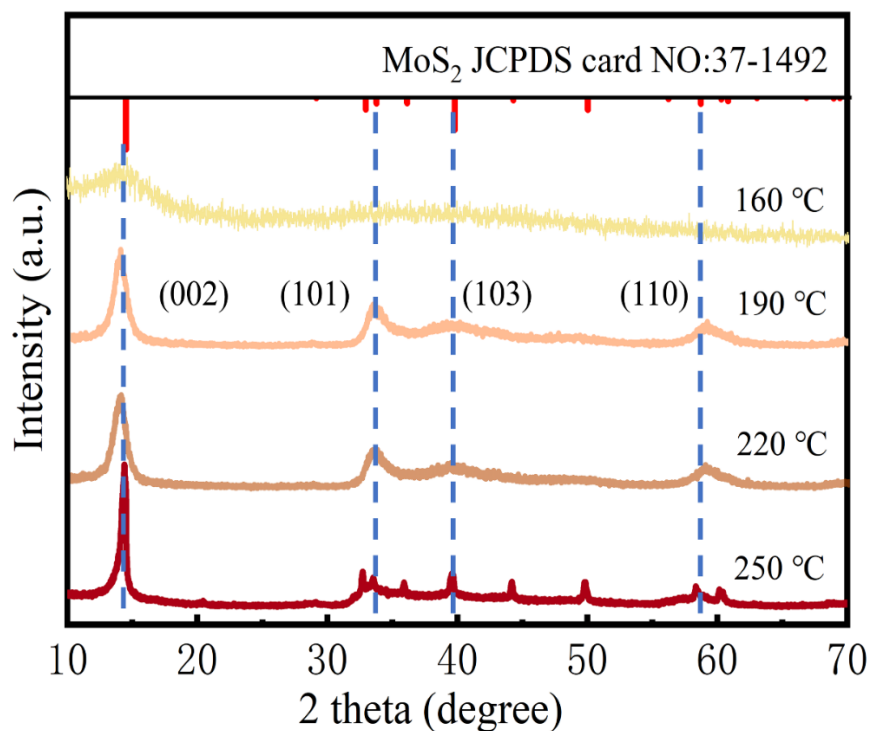
**Figure S3.** HRTEM images of samples R1 (a), R2 (b), R3 (c), R4 (d)



**Figure S4.** The electron diffraction patterns of sample R1.



**Figure S5.** FTIR spectra of the MoDTC, 10 min product (sample R1) and 90 min product (sample R3).



**Figure S6.** XRD of reaction productions synthesized at different temperatures (160 °C, 190 °C, 220 °C, and 250 °C)