Supporting Information

CuO Nanorod Arrays by Gas-phase Cation Exchange for Efficient Photoelectrochemical Water Splitting

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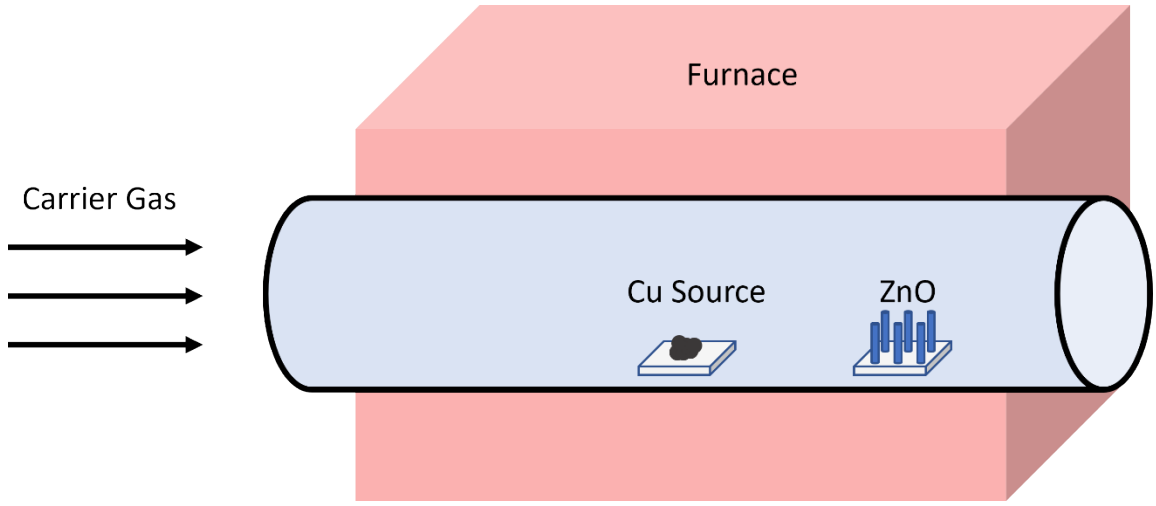

Figure S1. The schematic representation of the experimental setup for the gas-phase cation exchange.

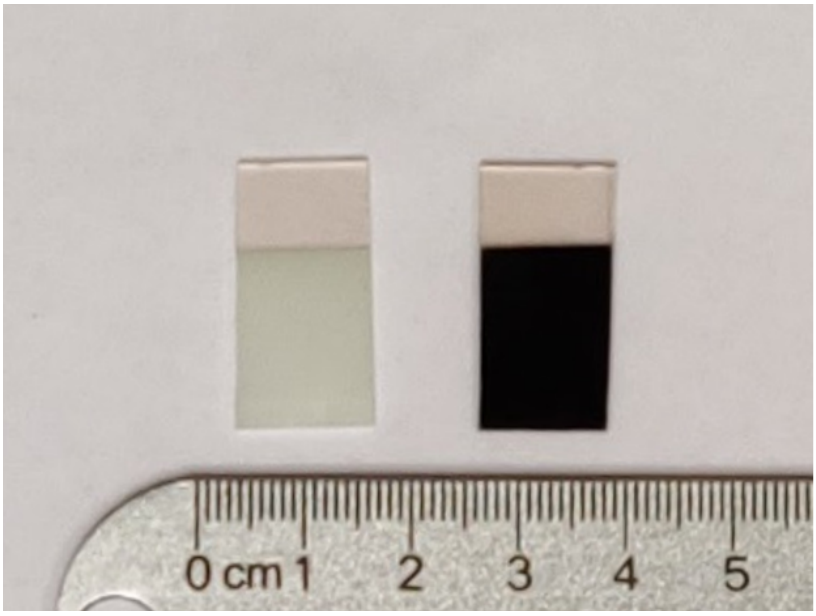

Figure S2. Photography of the ZnO nanorod arrays on ITO glass before (left) and after (right) the cation exchange reaction, showing the color change after the gas-phase cation exchange reaction.

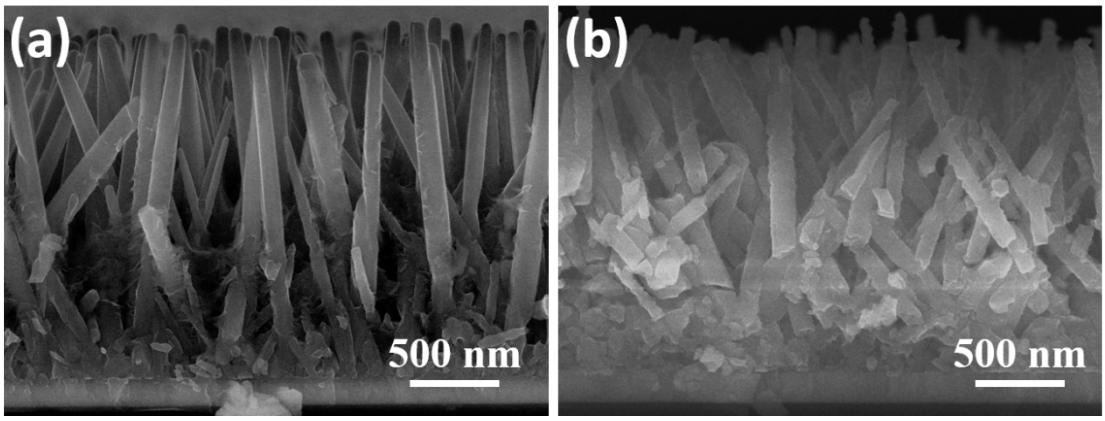

Figure S3. Cross-sectional SEM images of (a) ZnO and (b) CuO nanorod arrays, demonstrating the well preserves of the nanorod structures.

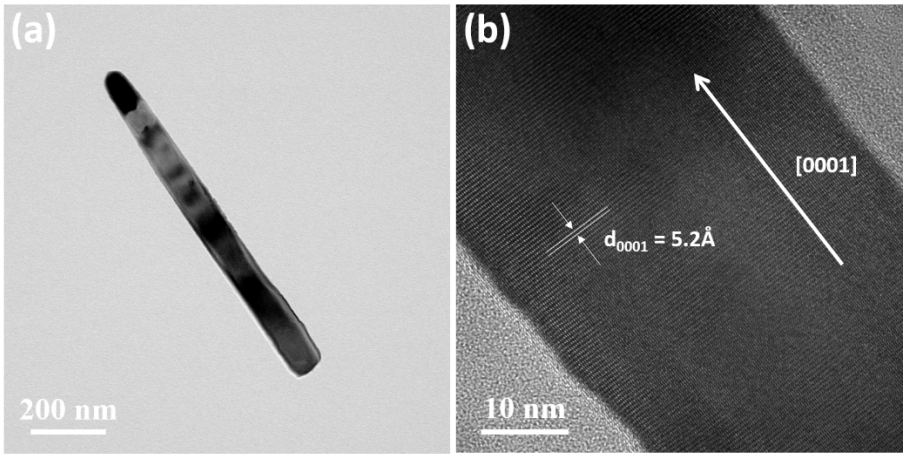

Figure S4. (a) Low-magnification and (b) HRTEM of a typical ZnO nanorod.

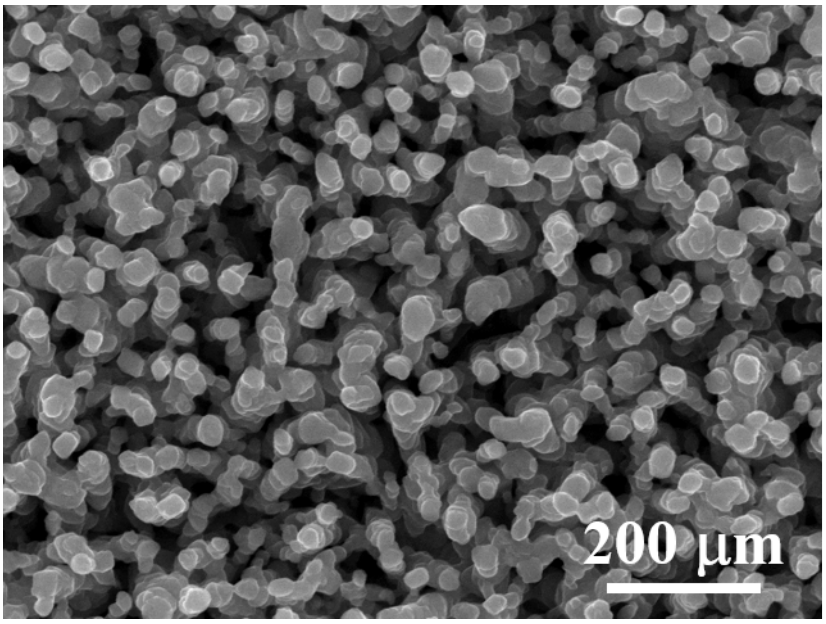

Figure S5. The SEM image of the sample under 650 C gas-phase cation exchange, indicates the deterioration of the nanostructures.

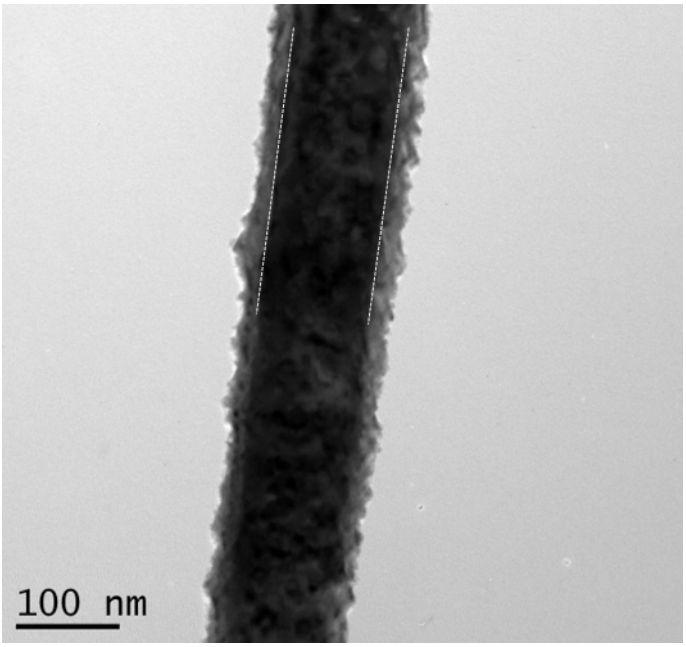

Figure S6. The TEM image of nanorod under 300 ℃ gas-phase cation exchange. A clear interface can be observed, revealing the partial cation exchange.

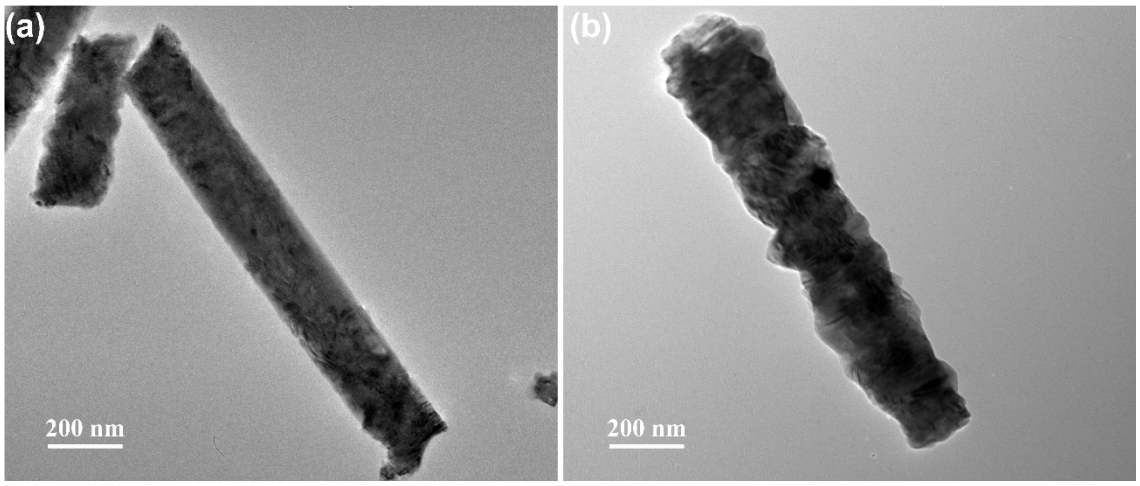

Figure S7. The TEM image of nanorod under (a) 400 and (b) 500℃.

Table S1. The fitted parameters based on the EIS measurements under different reaction temperatures.

Reaction temperature (℃)	**Photocurrent (mA/cm^2)**	**R_{ct} (Ω)**	**R_s (Ω)**
350	1.53	52.51	88.86
400	2.01	14.47	57.41
450	2.1	4.777	47.13
500	0.99	52.78	32.79