Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.


# Supporting Information

## A surface oxide layer of copper nanowires enhanced the UV selective response of a ZnO film photodetector

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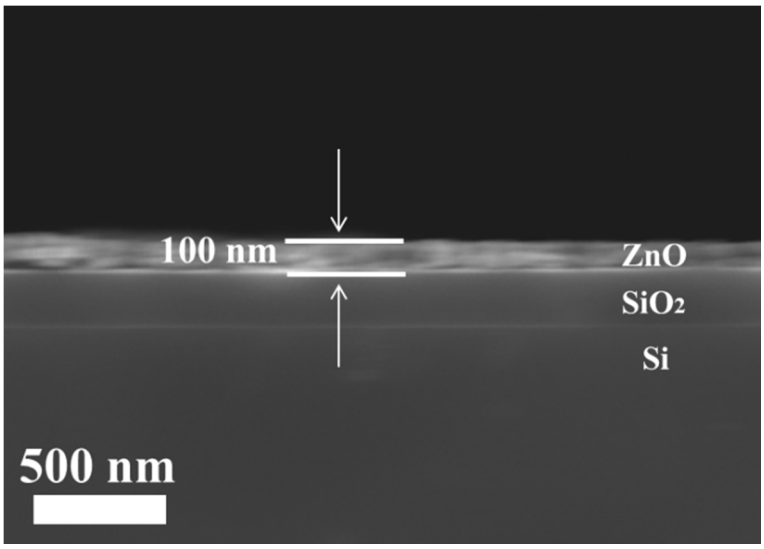


Fig. S1. The cross-section image of ZnO film prepared by spin-coating method.

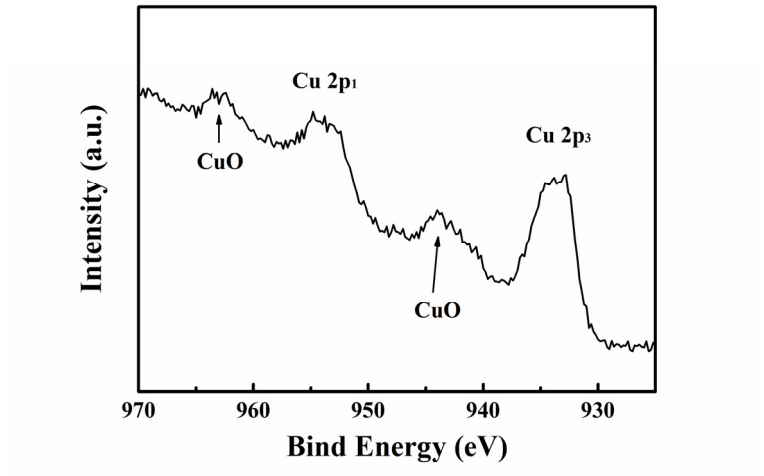


Fig. S2. The Cu 2p XPS spectra.

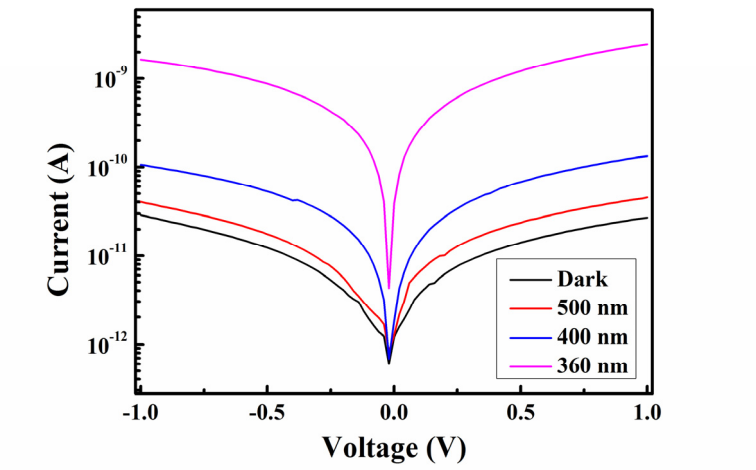


Fig. S3. The semi-log I-V curves of the Cu NW/ZnO PD in dark and under 360, 400 and 500 nm light illumination.

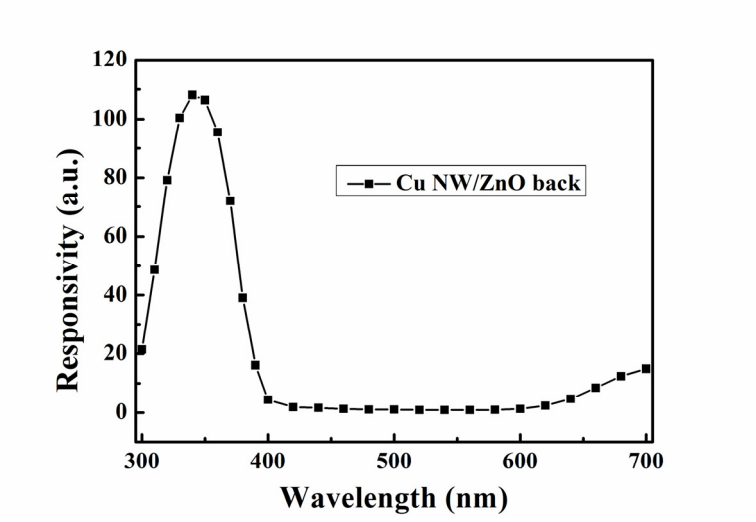


Fig. S4. The photo responsivity spectra of the Cu NW/ZnO composite with the UV light illuminated from the back side.

Table S1. Summary of the optoelectronic performance of the MSM type photodetector based on ZnO films.

| MSM type PDs based on ZnO films | Preparation method | Contact type | Bias voltage | Responsivity at UV region | Rejection ratio | Ref. |
|---|---|---|---|---|---|---|
| Au/ZnO film/Au | Molecular-beam epitaxy | Schottky/ Schottky | 0 V | 20 mA/W | 100 | [1] |
| Au/ZnO film/In | RF magnetron sputtering | Schottky/ Ohmic | 5 V | 0.36 mA/W | $10^4$ | [2] |
| Au/ZnO rods/Au | Hydrothermal | Schottky/ Schottky | 1 V | $1.44\times10^5$ A/W | 17.4 | [3] |
| Au/Density ZnO rods/Au | | | 1 V | $7.01\times10^3$ A/W | 281.2 | |
| Au/ZnO:Ga/Au | Aqueous solution method | Schottky/ Schottky | 1 V | 5.75 A/W | 36.1 | [4] |
| Au/ZnO wall/Au | Thermal evaporation | Schottky/ Schottky | 5 V | ~ 4 A/W | 29 | [5] |
| AuAg/ZnO rods/AuAg | Hydrothermal | Schottky/ Schottky | 1 V | $10^2$ A/W | 174.6 | [6] |
| Au/ZnONW &Graphene/Au | CVD Hydrothermal | Schottky/ Schottky | 1 V | 188 A/W | $10^4$ | [7] |
| Au/ZnONW/Au | Hydrothermal | Schottky/ Schottky | 1 V | | 10-100 | |
| Au/PEDOT:PSS/ ZnO/TiAu | Single crystal ZnO | Schottky/ Ohmic | 0 V | 0.3 A/W | $10^3$ | [8] |
| CrAu/ZnO/CrAu | Spin-coating | Ohmic/Ohmic | 1 V | 0.9 mA/W | 3.7 | This work |
| Ag/Cu/ZnO/Ag | Spin-coating | Schottky/ Ohmic | 1 V | 1.1 mA/W | 67 | |
| Ag/CuNW/ZnO/Ag | Hydrothermal Spin-coating | Schottky/ Ohmic | 1 V | 0.65 mA/W | 160 | |


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