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## High-performing flexible and transparent photodetector by using silver nanowire-networks

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- ▶ Flexible and transparent Ni/ZnO/AgNWs/cPI photodetector was achieved.
- ▶ AgNW-networks provide the enhanced interfacial surface for effective charge collection.
- ▶ Ultrahigh responsivity ( $1.46 \times 10^4$  A/W) by using AgNW-networked photodetector.

### ABSTRACT

Transparent and flexible photodetector was realized by effective interfacial design methods. Silver nanowires (AgNWs) were networked onto a colorless polyimide (cPI) substrate to ensure the transparent conductive front electrode of Ni/ZnO/AgNWs/cPI photodetector. Under UV illumination, remarkable performances were obtained for quick responses (rise time=0.987 ms and fall time=2.49 ms) and ultrahigh responsivity ( $1.46 \times 10^4$  A/W). Due to the merit of AgNW-networks, an enhanced interfacial surface was established for the ZnO film, simultaneously providing efficiently short pathways for the collection of photo-generated carriers. The AgNWs-embedding Schottky photodetector gave an excellent noise equivalent power of  $4.38 \times 10^{-15}$  W/Hz<sup>1/2</sup>, which is suitable for femtowatt-level photodetection. We demonstrate that the active adoption of metallic nanowires would provide high-degree of freedom for high-performing photoelectric devices with satisfying flexible and transparent features.

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