

Electronic Supplementary Information (ESI) for RSC Advances.
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An extreme high-performance ultraviolet photovoltaic detector based on ZnO nanorods/phenanthrene heterojunction

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• Chemicals:

Acetone (99%) was purchased from Chongqing Chuandong Chemical Co., Ltd., ethanol (99%) and glacial acetic acid (99%) were purchased from Tianjin Zhiyuan Chemical Reagent Co., Ltd., ethanamine (99%) and hexamethylenamine (99%) were purchased from Tianjin Fengchuan Chemical Reagent Technologies Co., Ltd., ethylene glycol was purchased from Tianjin Guangfu Fine Chemical Research Institute.

• The effect of Phen concentration on device performance

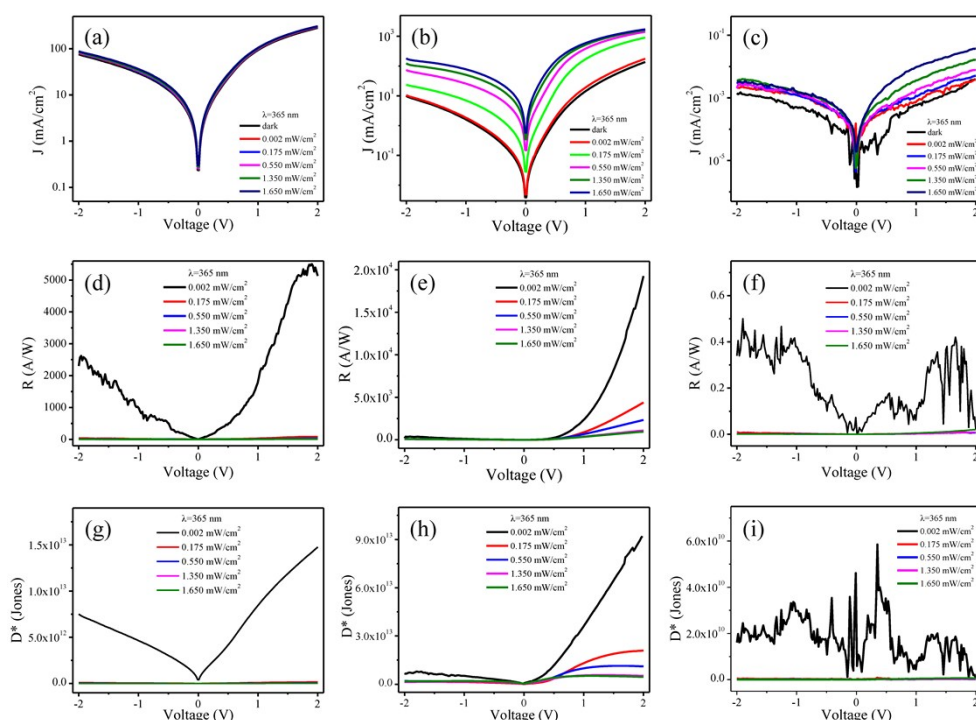


Figure S1. The effect of Phen concentration on device performance. Devices A((a),(d) and(g)), B((b),(e) and(h)) and C((c),(f) and(i)) were fabricated using Phen solutions with 0.5, 2.5, 10.0 g L⁻¹, respectively.

A number of Phen solutions (0.5, 2.5 and 10 g L⁻¹) were used to fabricate ZnO/Phen UV OPV detectors as shown in Figure S1, the responsivity (R) and detectivity (D^*) of device A (0.5 g L⁻¹) are larger than device C (10.0 g L⁻¹), but smaller than device B (2.5 g L⁻¹), showing that the best performance of the device (device B) should have a proper ratio of Phen to ZnO nanorods, for the reason that the thinner Phen film(made from 0.5 g L⁻¹ solution) or the thicker Phen film (made from 10.0 g L⁻¹ solution) are not effective for the photon-absorption(thinner film), the transport and collection of photon-generated carriers(thicker film). Therefore, only a proper thickness of Phen (device B, made from 2.5 g L⁻¹ solution) may get the high performance.

• The performance of ZnO/Phen UV OPV detector

Table S1. The performance comparison of the ZnO Nanorods/Phen UV detector with some common UV detectors.

Detectors	Detectivity (cm Hz ^{1/2} W ⁻¹)	References
GaN	1.23×10^{10}	S1
ZnO	1.04×10^{12}	S2
Si PD	$\sim 10^{12}$	S3
Polymer PD	3.90×10^{10}	S3
NPB:BAIq	8.26×10^{11}	S4
BCP	9.02×10^{11}	S5
ZnO Nanorods/Phen	9.0×10^{13}	This work

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