Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

A High Responsivity, High Detectivity and High Response Speed MSM UVB Photodetector based on SnO_2 Microwires

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S1 Comparisons between the fabricated SnO_2 MWs in this work and other previous reports

Tab. S1 shows the comparison of the device performance parameters for this work and some previous reports. Similar with the junction type devices, the SnO_2 MW in this work also shows relatively low dark current and response time, which is attributed to the relatively high crystal quality and small amount of oxygen vacancies existed inside the material. While different with the reported junction type devices, SnO_2 MW in this work shows higher responsivity and specific detectivity, which can be attributed to the excellent performance of carrier generation and transportation.

Tab. S1 Comparisons between the fabricated SnO_2 MWs in this work and other previous reports.

Material	**Bias** V	**Dark current** A	**Responsivity** $A \cdot W^{-1}$	**Detectivity** Jones	**Response time** s	**Ref.**
$SnO_2/CsPbBr_3$	3	1.0×10^{-10}	2.0	1.2×10^{13}	1.94×10^{-3}	1
SnO_2	3	1.0×10^{-9}	--	--	1.0	2
β-Ga_2O_3/SnO_2	2	2.0×10^{-9}	--	--	28.0	3
SnO_2/p-GaN	-3	1.6×10^{-8}	1.45	1.31×10^{13}	0.51	4
PEDOT:PSS/SnO_2	-10	1.1×10^{-4}	1.8×10^{-3}	--	--	5
SnO_2/p-InGaN	0	--	0.1	3.5×10^{12} (-0.1 V)	0.5	6
SnO_2 (322 nm, 0.25 μW/cm^2)	10	3.69×10^{-9}	1.353×10^{3}	5.4×10^{14}	$< 8.0\times10^{-2}$	This work

S2 The absorption spectrum of single SnO_2 MW

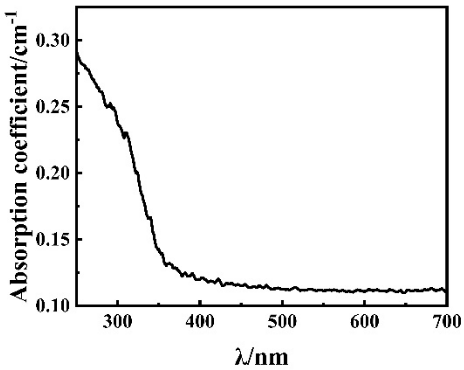

Fig. S1 Absorption spectrum of single SnO2 MW

S3 The element content and distribution of SnO_2 MWs

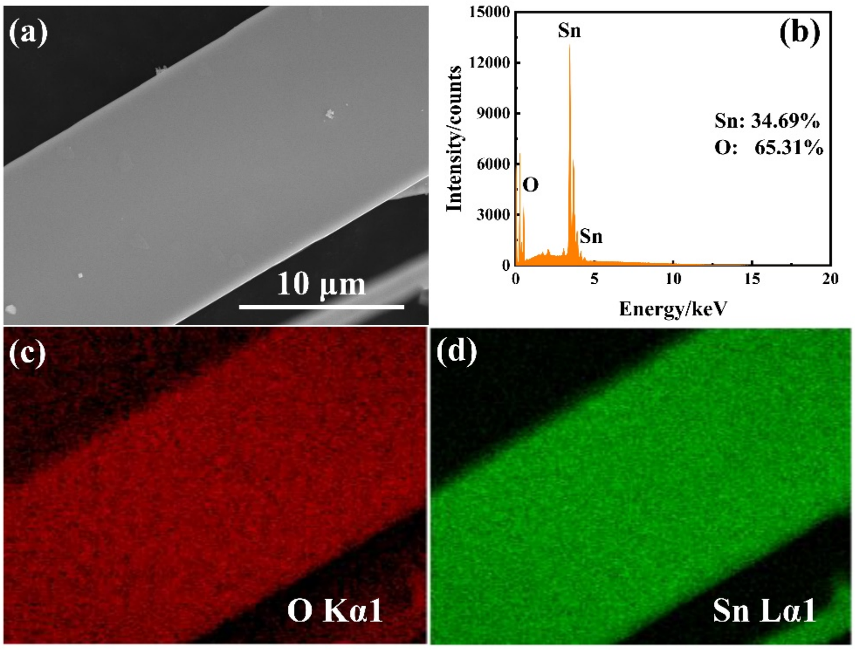

Fig. S2 (a) The SEM image of SnO_2 MWs; (b) the measured distribution spectrum of elements; (c - d) the measured element mappings of O and Sn elements in SnO_2 MWs.

References

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