Supplementary Materials

Article

Efficient Diode Performance with Improved Effective Carrier Lifetime and Absorption using Bismuth Nanoparticles Passivated Silicon Nanowires

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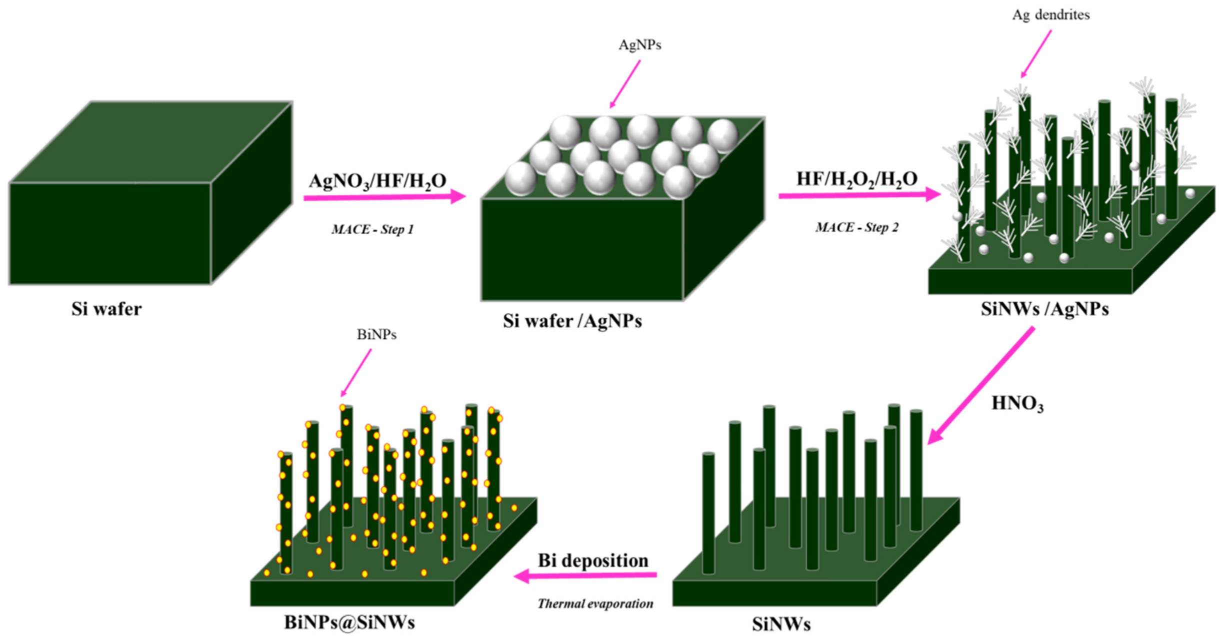
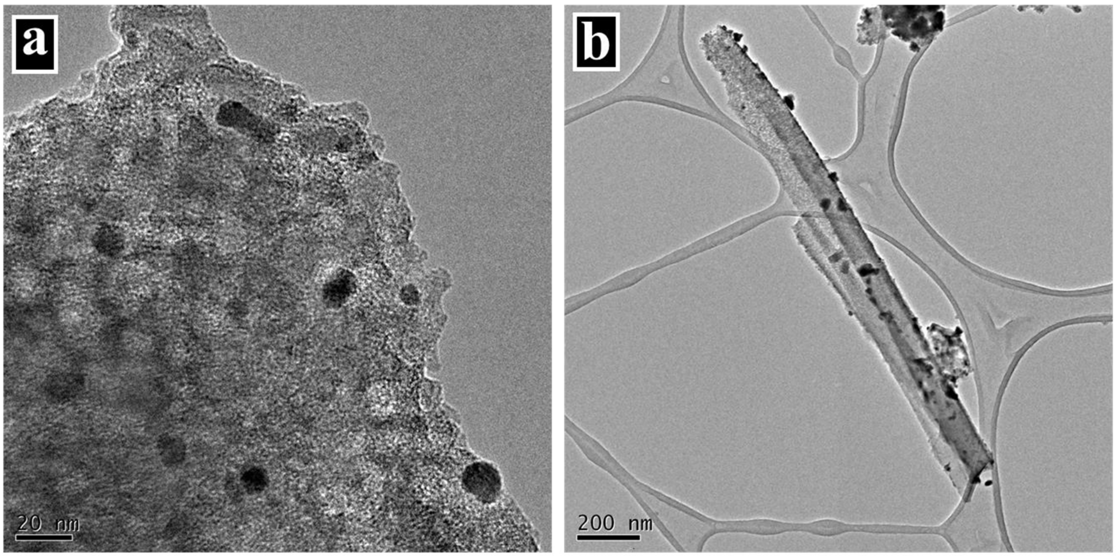


Figure S1. Schematic illustration for the fabrication of BiNPs@SiNWs nanocomposite



c

Element	Weight %	Atomic %	Net Int.	Error %	Kratio	Z	R	A	F
C K	9.04	18.33	40.76	12.08	0.0085	1.1327	0.9261	0.0833	1.0000
O K	9.44	14.38	229.55	9.70	0.0203	1.0868	0.9491	0.1979	1.0000
SiK	76.93	66.75	14355.20	1.75	0.7123	0.9923	1.0002	0.9314	1.0019
BiM	4.59	0.54	186.63	5.78	0.0272	0.6423	1.4068	0.8660	1.0679

Figure S2. (a,b) TEM images of Bi-rich SiNWs sample and **(c)** corresponding EDX table of the elemental concentration

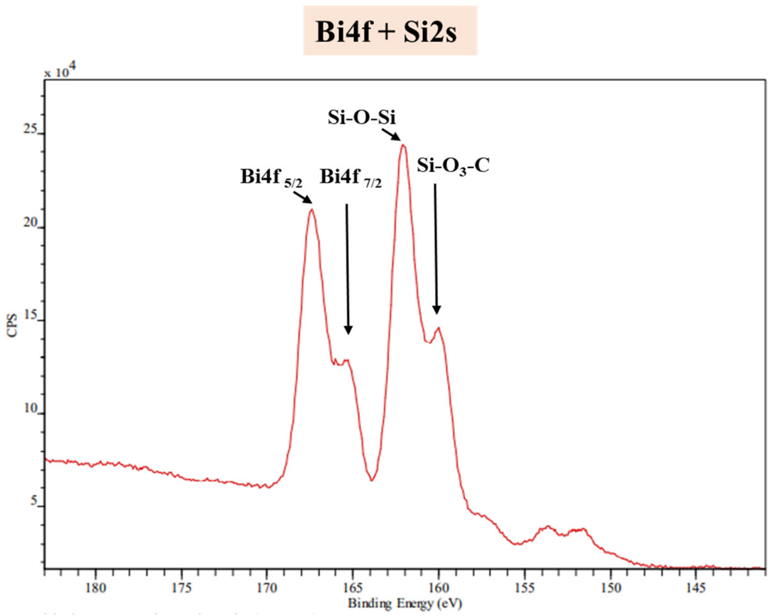


Figure S3. Deconvolution of Bi4f and Si2s XPS peaks

Table S1. Comparison of Bi@SiNWs diode performance with other modified-SiNWs devices of various works

Devices	SiNWs formation technique	Material deposition technique	η determination technique	η	references
Pt@SiNWs	MACE	Electroless deposition	conventional TE	9.61	[19]
Ag@SiNWs	MACE	Electroless deposition	conventional TE	7.78	[19]
Graphene@SiNWs	MACE	PECVD	conventional TE	3.92 ~ 5.52	[39]
Ag@SiNWs/polymer	MACE	Electroless deposition	conventional TE	2.16 ~ 2.41	[40]
Pt@SiNWs	MACE	Placing Pt Tip (monocontact)	conventional TE	3.7	[41]
Polymer@SiNWs	MACE	Spin coating	conventional TE	7.8	[42]
Bi@SiNWs	MACE	Thermal evaporation	conventional TE → Cheung's functions →	1.88 1.96	This work