Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Metal oxide embedded carbon-based materials for polymer solar cell and X-ray detector

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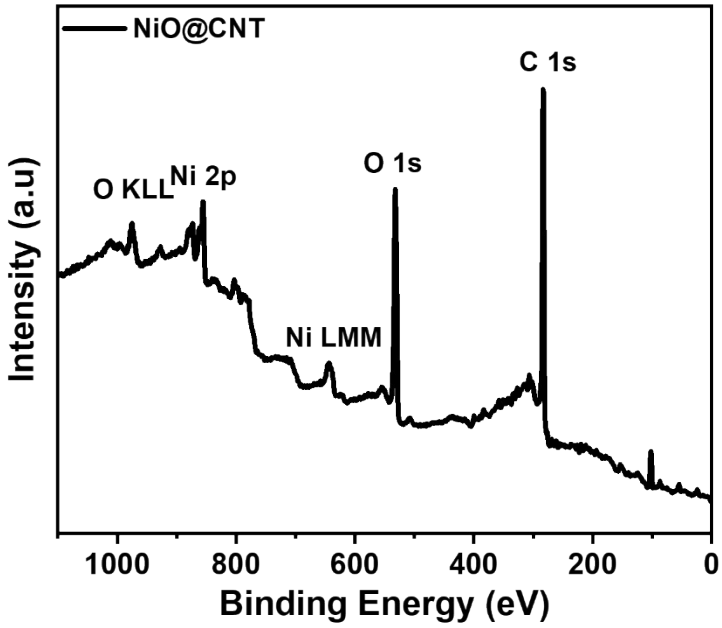
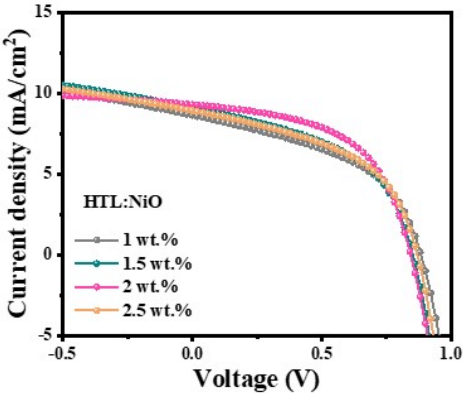
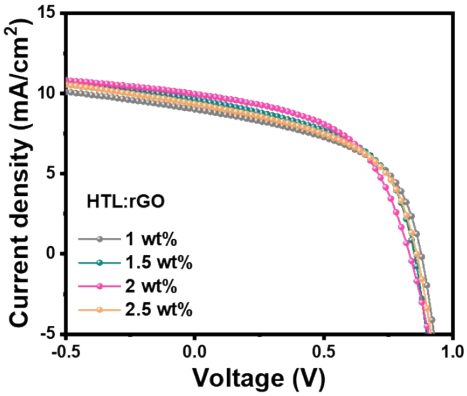


Figure S1. XPS survey scan of NiO@CNT hybrid nanoparticles.



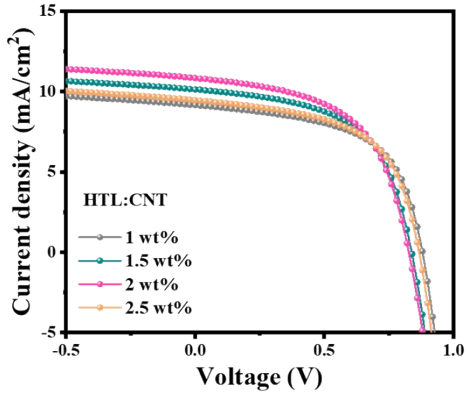
Device	V_{OC} [V]	J_{SC} [mA/cm²]	FF [%]	PCE [%]	R_S [Ω·cm²]
1 wt.%	0.883	8.67	53.82	4.12	381.36
1.5 wt.%	0.851	9.15	59.84	4.66	362.18
2 wt.%	0.843	9.34	61.47	4.84	357.62
2.5 wt.%	0.868	8.96	56.32	4.38	371.49

Revised Figure S2. *J–V* curves of NiO (1, 1.5, 2 and 2.5 wt.%) comprised BJH solar cell.



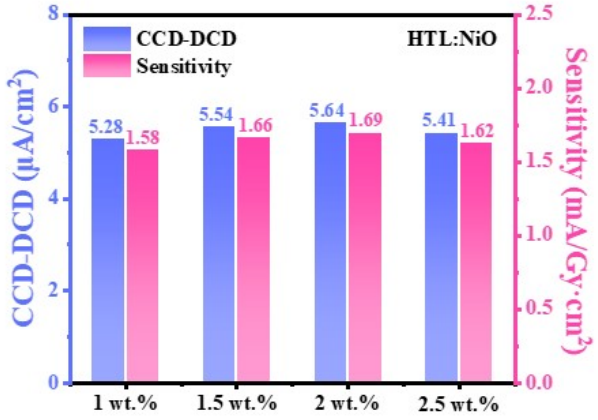
Device	V_{OC} [V]	J_{SC} [mA/cm²]	FF [%]	PCE [%]	R_S [Ω·cm²]
1 wt%	0.877	8.99	57.33	4.52	364.92
1.5 wt%	0.851	9.62	63.15	5.17	341.56
2 wt%	0.832	9.96	65.89	5.46	328.19
2.5 wt%	0.859	9.35	60.39	4.85	355.24

Figure S3. *J–V* curves of rGO (1, 1.5, 2 and 2.5 wt.%) comprised BJH solar cell.

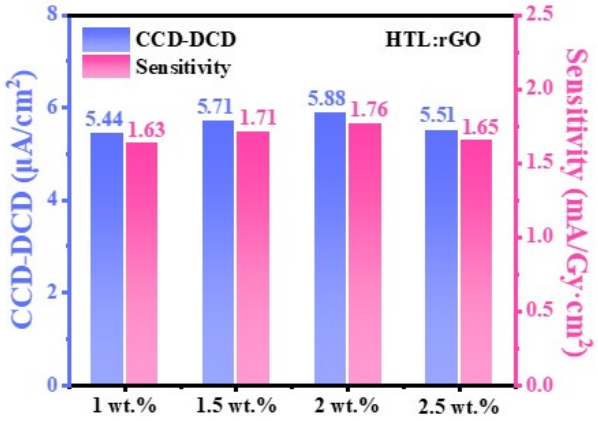


Device	V_{OC} [V]	J_{SC} [mA/cm²]	FF [%]	PCE [%]	R_S [Ω·cm²]
1 wt%	0.881	9.16	57.87	4.67	359.92
1.5 wt%	0.838	10.13	64.55	5.48	326.74
2 wt%	0.827	10.84	65.70	5.89	309.15
2.5 wt%	0.867	9.47	61.14	5.02	349.86

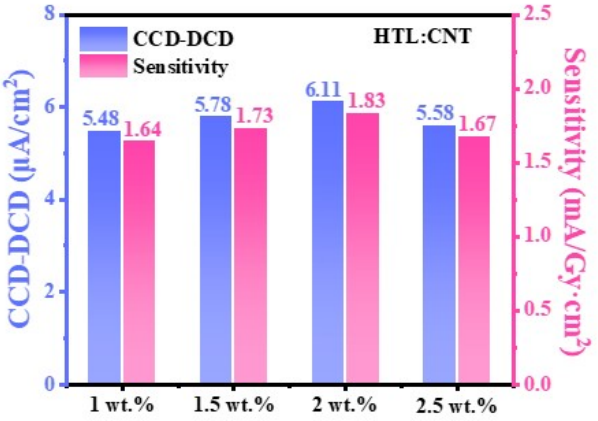
Figure S4. *J–V* curves of CNT (1, 1.5, 2 and 2.5 wt.%) comprised BJH solar cell.



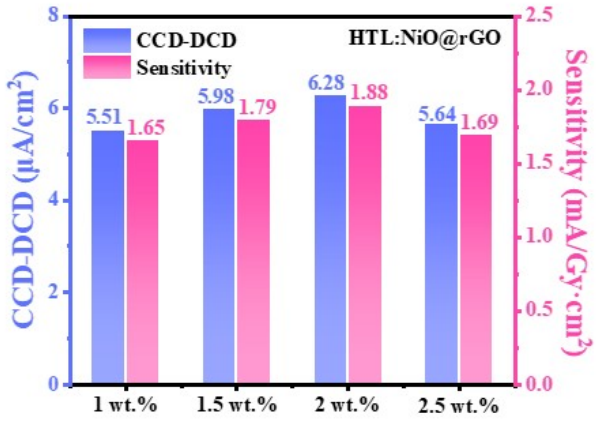
NS 1	CCD-DCD [μA/cm²]	Sensitivity [mA/Gy•cm²]
1 wt.%	5.28	1.58
1.5 wt.%	5.54	1.66
2 wt.%	5.64	1.69
2.5 wt.%	5.41	1.62



NS 1	CCD-DCD [μA/cm²]	Sensitivity [mA/Gy•cm²]
1 wt.%	5.44	1.63
1.5 wt.%	5.71	1.71
2 wt.%	5.88	1.76
2.5 wt.%	5.51	1.65



NS 1	CCD-DCD [μA/cm²]	Sensitivity [mA/Gy•cm²]
1 wt.%	5.48	1.64
1.5 wt.%	5.78	1.73
2 wt.%	6.11	1.83
2.5 wt.%	5.58	1.67



NS 1	CCD-DCD [μA/cm²]	Sensitivity [mA/Gy•cm²]
1 wt.%	5.51	1.65
1.5 wt.%	5.98	1.79
2 wt.%	6.28	1.88
2.5 wt.%	5.64	1.69

Figure S5. CCD-DCD and sensitivity at NiO, rGO, CNT, and NiO_2@rGO with (1, 1.5, 2 and 2.5 wt.%) of X-ray detector.