Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting information

(2-methylpiperidine)PbI_3: an ABX_3-type organic-inorganic hybrid chain compound and its semiconductive nanowires with photoconductive performances

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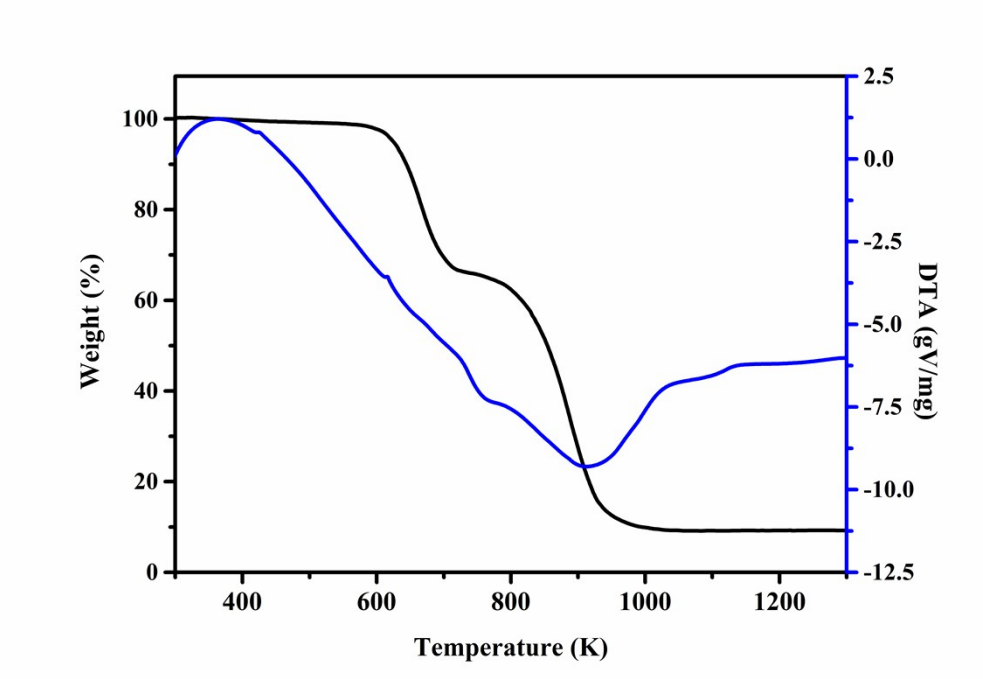

Figure S1: TGA curve of **1** was measured, which show that **1** maintains thermal stability until 610 K.

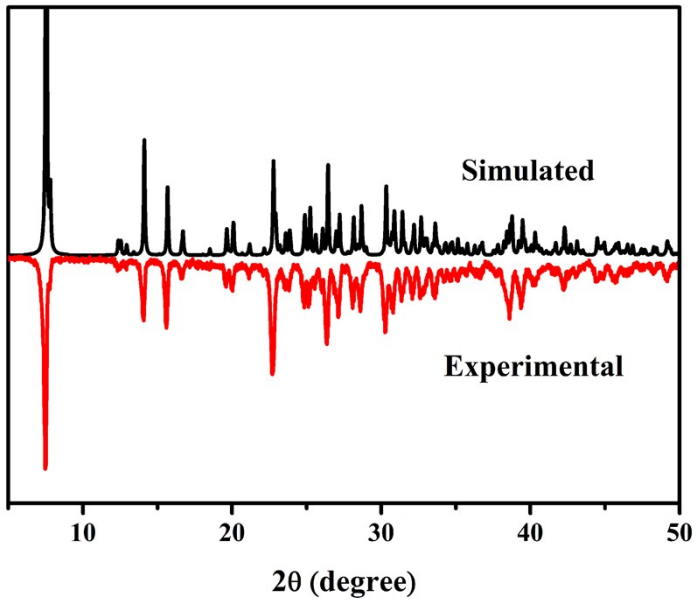

Figure S2：Experimental and simulated powder X-ray diffraction patterns of **1**.

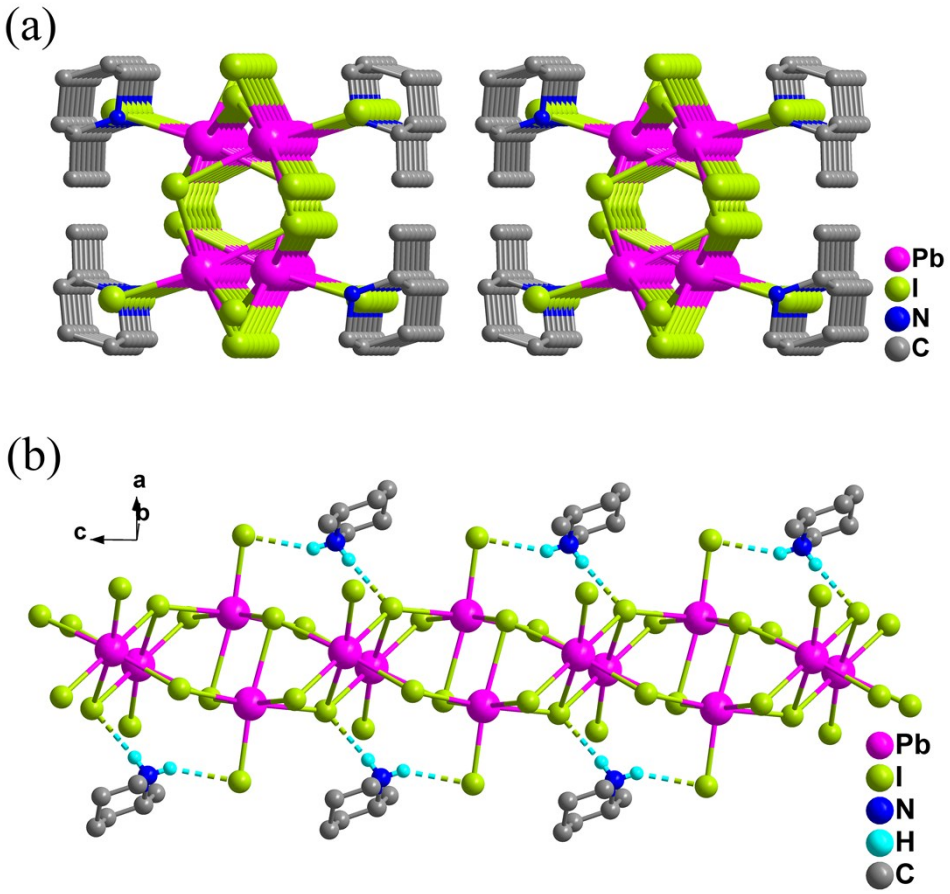

Figure S3: (a) 1D infinite double chains are surrounded by organic cations to form quantum wire structure. (b) The N-H···I hydrogen-bonding interactions of **1** were showed. There are two different lengths of hydrogen bonds between donor (N) and acceptor (I), one bond length is 3.5675 Å by connecting N and terminal I, and the other is 3.6021 Å by interacting N and triple bridged I. (In order to clearly express the hydrogen bond, some hydrogen atoms were removed).

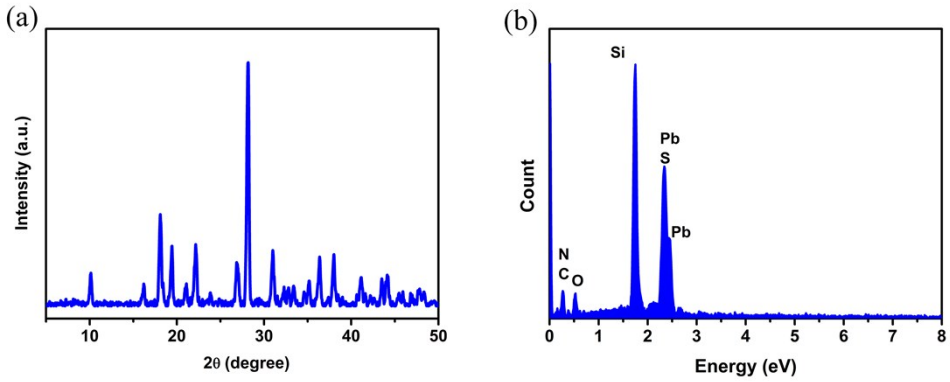

Figure S4: (a) Powder X-ray diffraction pattern of the precursor NWs. (b) energy dispersive X-ray spectroscopy of the precursor NWs on Si substrate.

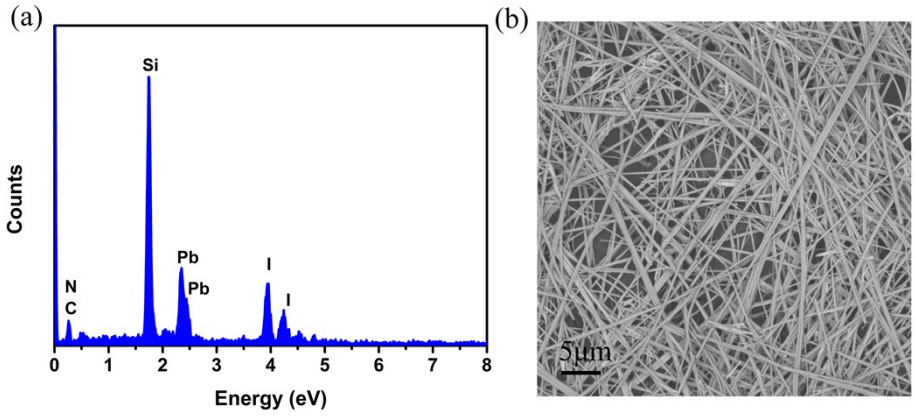

Figure S5: (a) Energy dispersive X-ray spectroscopy of the prepared NWs on Si substrate. (b) SEM image of the prepared NWs.

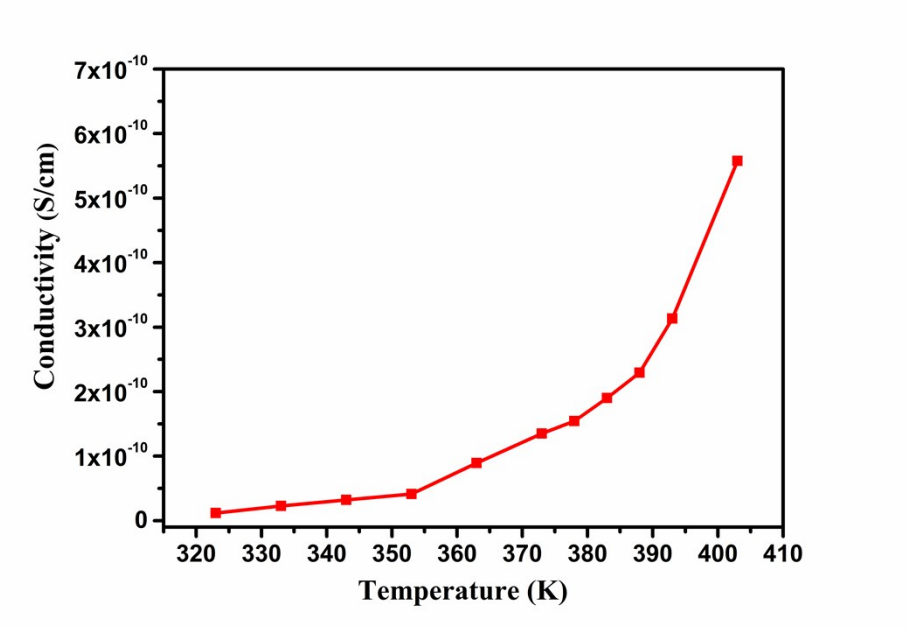

Figure S6: Temperature-dependent conductivity of **1.**

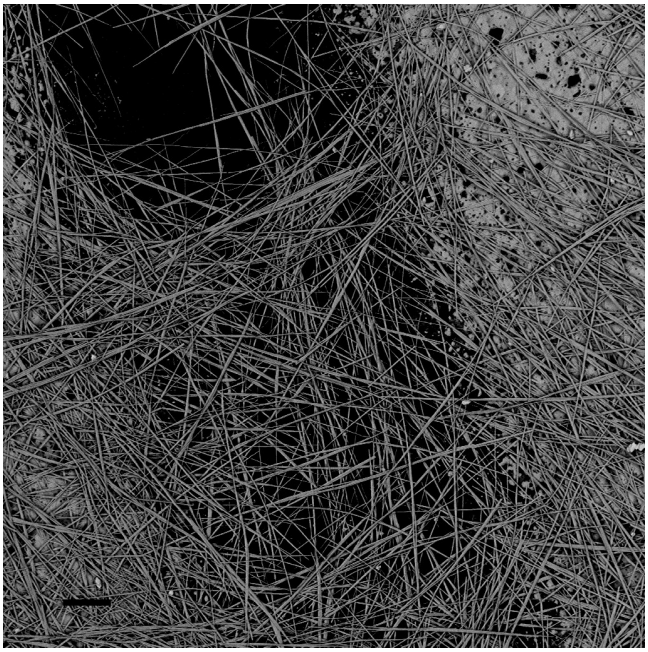

Figure S7: SEM image of hybrid NWs in gold interdigital electrode. Scale: 20 μm

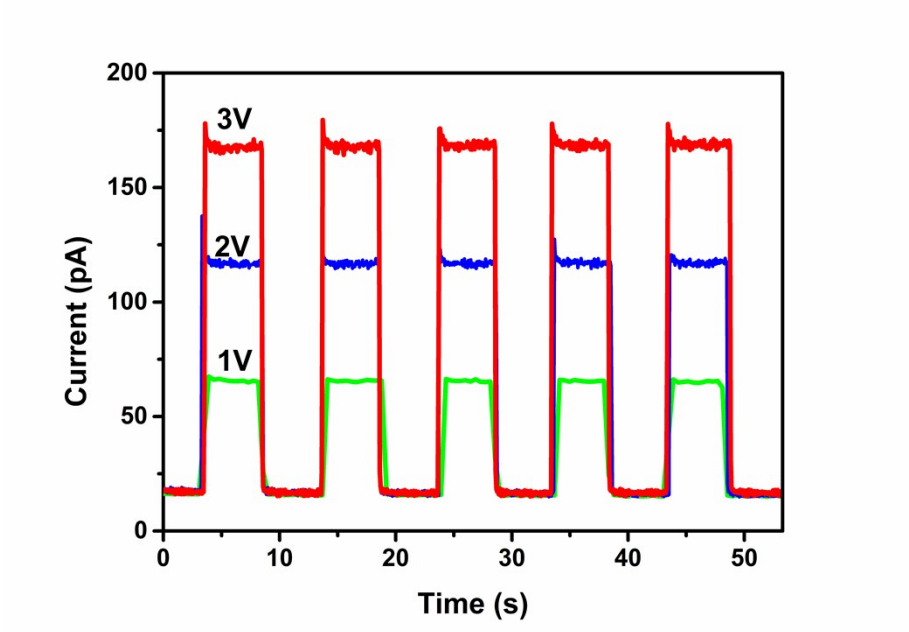

Figure S8: Photoreponse of the prepared nanowires at bias of 1, 2, 3V, respectivly.

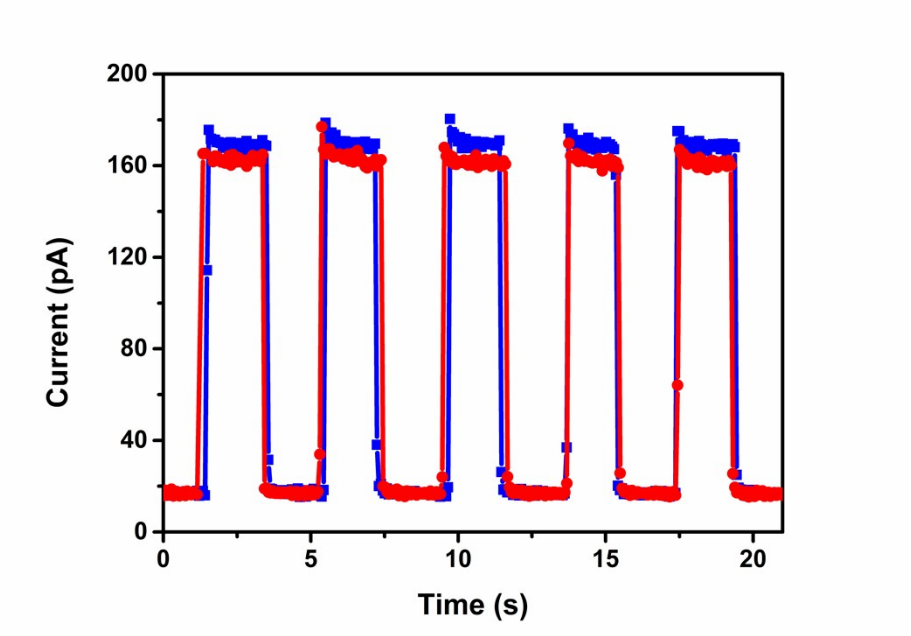

Figure S9: Photoreponse of the as-prepared nanowires (blue line) and after 3 weeks of storage in ambient condition (red line).

Table S1: Crystal data and structural refinement details of **1** at 293 K.

Empirical formula	$C_6H_{14}NPb\ I_3$
Formula weight	688.07
Temperature	293K
Crystal system, space group	Orthorhombic, *Pbcn*
Unit cell dimensions	a = 13.6826(4) Å
	b = 22.5930(7) Å
	c = 9.0276(3) Å
	α = *90*
	β= *90*
	γ = 90
Volume	2790.71(15) Å^3
Z, Calculated density	8, 3.275 g/cm^3
F(000)	2384
Limiting indices	-17<=h<=12
	-21<=k<=28
	-11<=l<=11
Reflections collected / unique	9525/2849
Completeness	99.70 %
Data / restraints / parameters	2849/0/102
Final R indices [$I>2\sigma(I)$]	R_1 = 0.0255, wR_2 = 0.0437
R indices (all data)	R_1 = 0.0343, wR_2 = 0.0466

$^aR_1 = \Sigma||F_o|-|F_c||/\Sigma|F_o|$, $wR_2 = \{\Sigma[w(F_o^2-F_c^2)^2]/\ \Sigma w[(F_o)^2]^2\}^{1/2}$