Electronic Supplementary Information for

Construction of hierarchical IrTe nanotubes with assembled nanosheets for overall water splitting electrocatalysis

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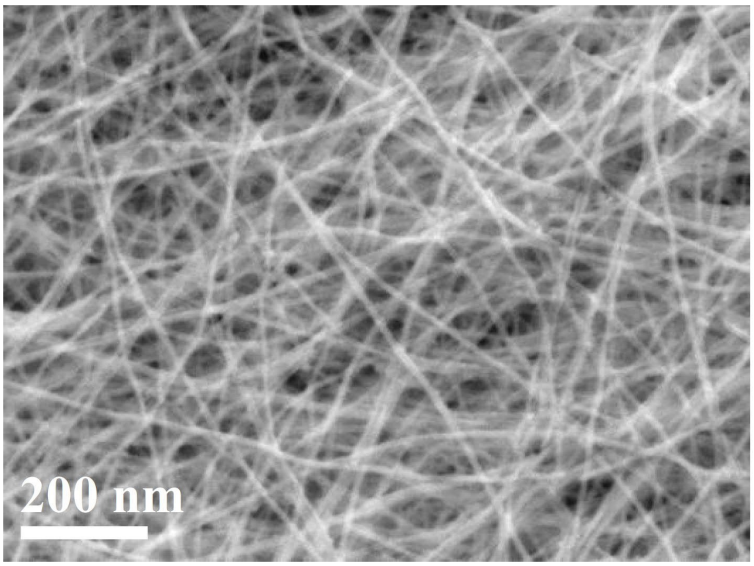

Fig. S1 SEM image of the Te NWs.

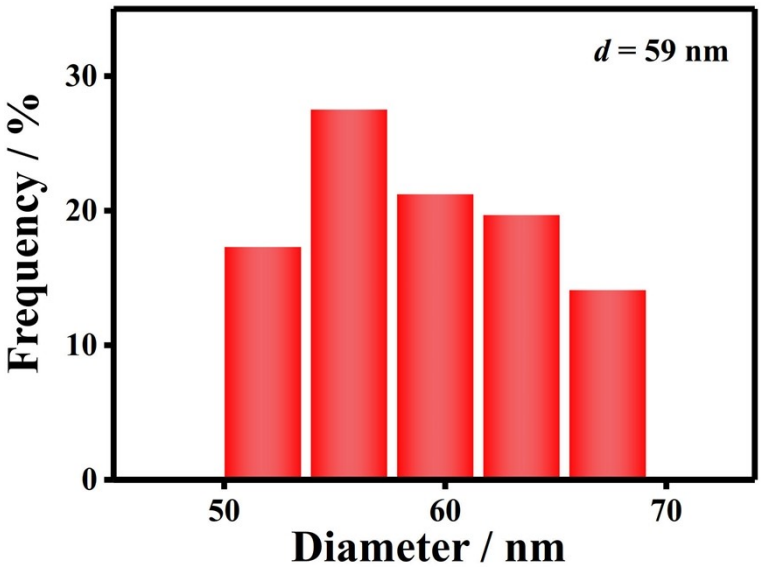

Fig. S2 Histogram of the diameter of IrTe NTs.

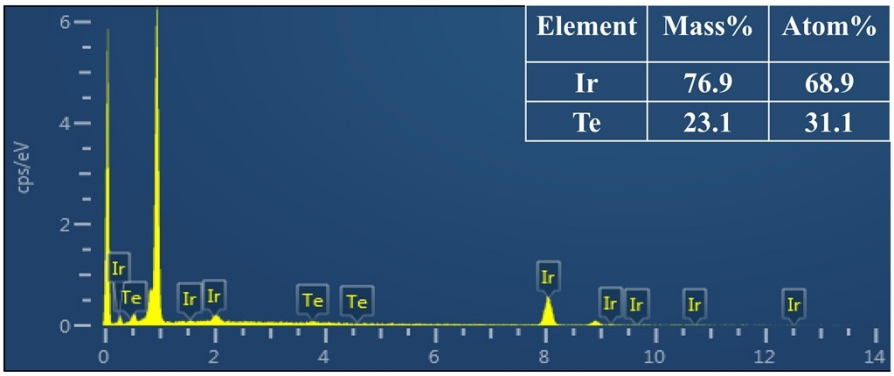

Fig. S3 EDX spectrum of the IrTe NTs.

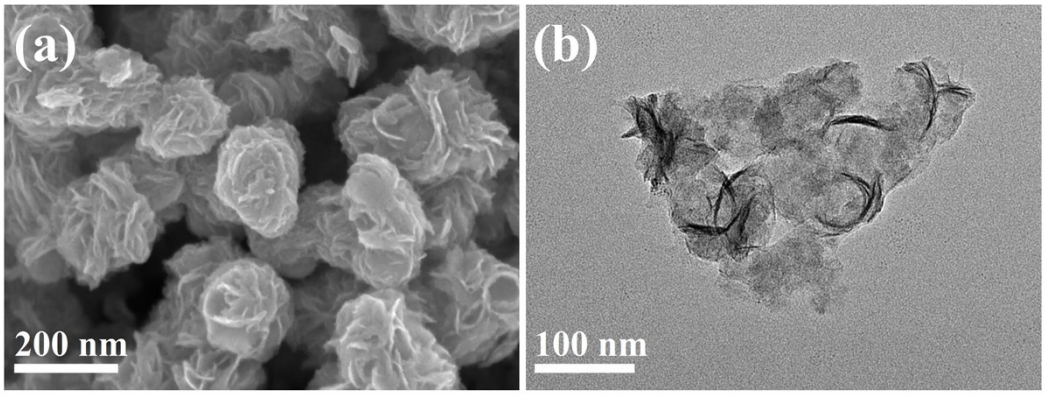

Fig. S4 (a) SEM and (b) TEM images of Ir NSs.

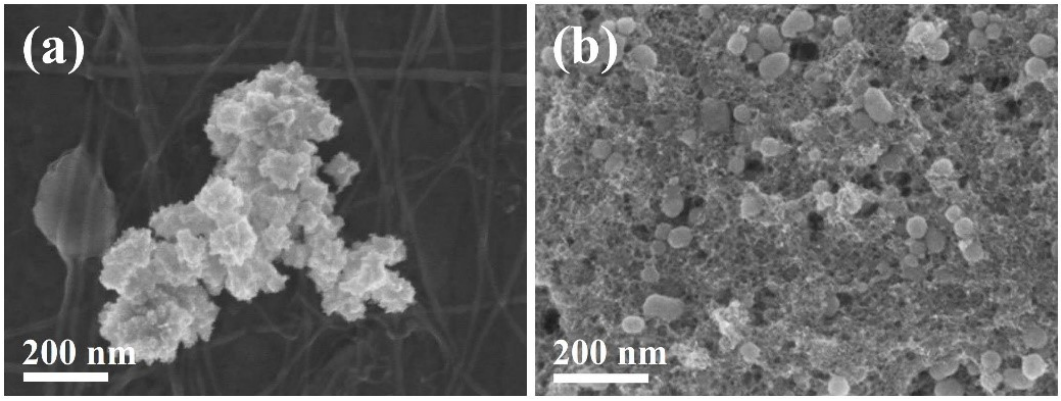

Fig. S5 SEM images of the samples obtained by replacing formic acid with (a) L-ascorbic acid and (b) $NaBH_4$.

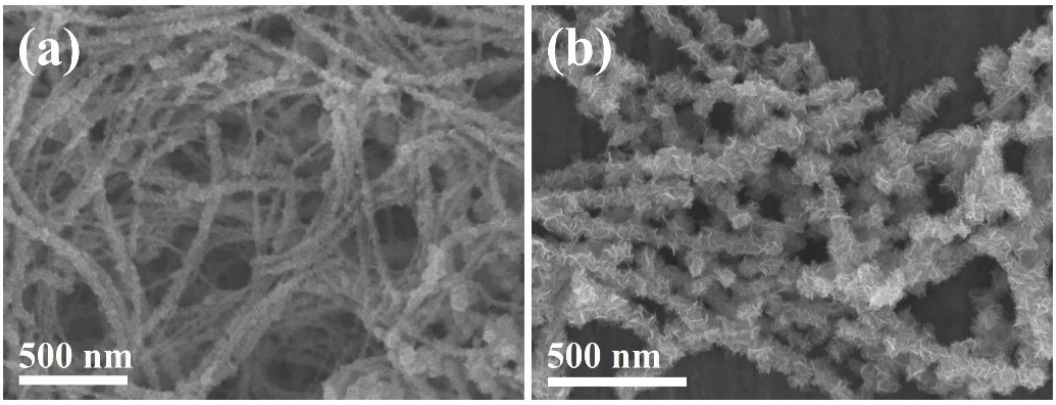

Fig. S6 SEM images of the samples prepared with (a) 5 mM and (b) 20 mM $IrCl_3$.

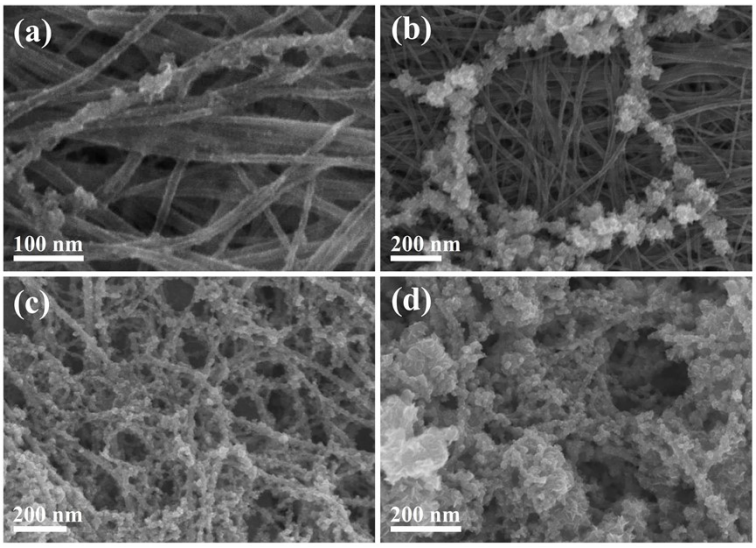

Fig. S7 SEM images of the samples prepared at different reaction times in the typical synthesis conditions: (a) 0.5 h, (b) 1 h, (c) 2 h and (d) 4 h.

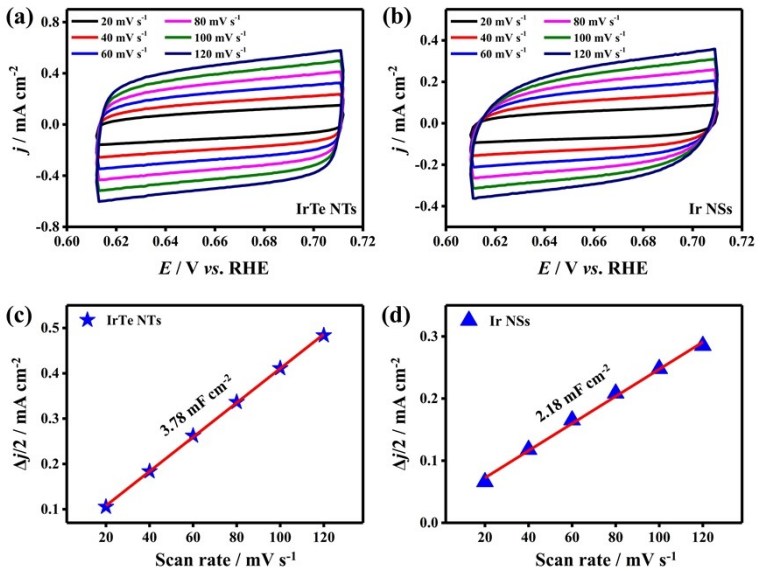

Fig. S8 Cyclic voltammograms for (a) IrTe NTs and (b) Ir NSs recorded in the same potential range with increasing scan rates. Capacitive current densities at 0.66 V derived from CVs against scan rates for (c) IrTe NTs, (d) Ir NSs.

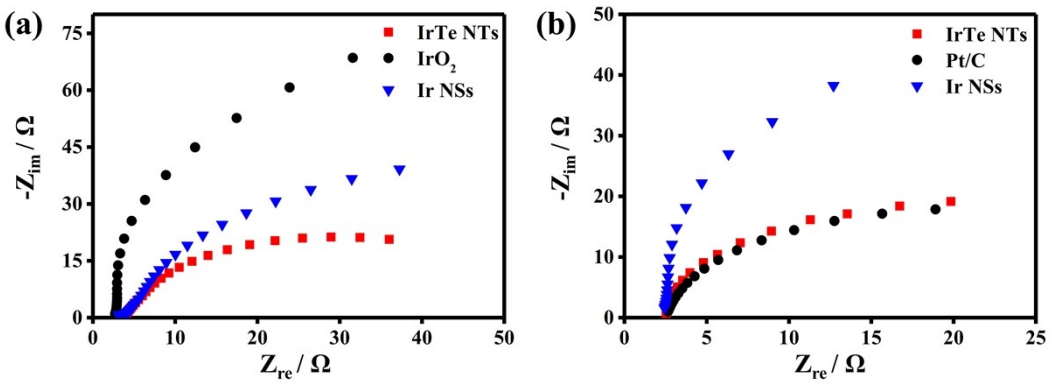

Fig. S9 Nyquist plots for different catalysts recorded at (a) 1.49 V (*vs*. RHE) and (b) -0.1 V (*vs*. RHE). The frequency ranges from 100 kHz to 0.1 Hz.

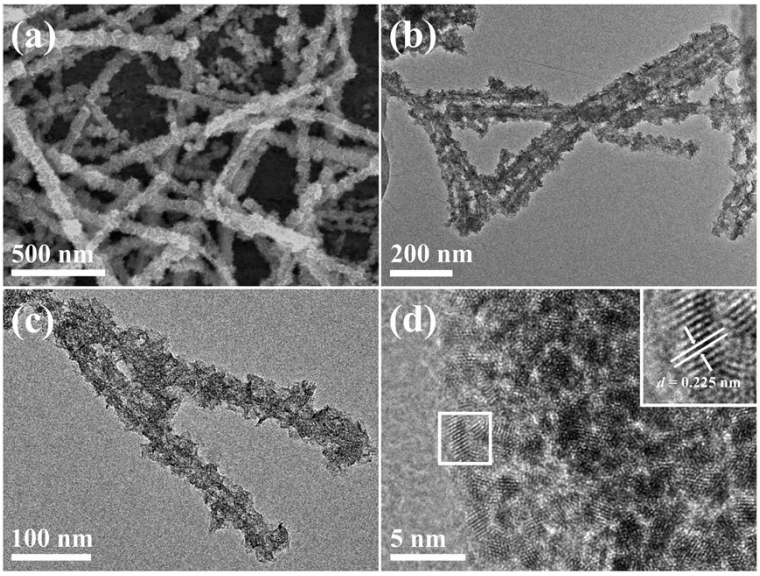

Fig. S10 SEM (a), TEM (b, c) and HRTEM (d) images of the IrTe NTs after the stability test. The inset in (d) reveals the square area of the Fourier-filtered lattice.

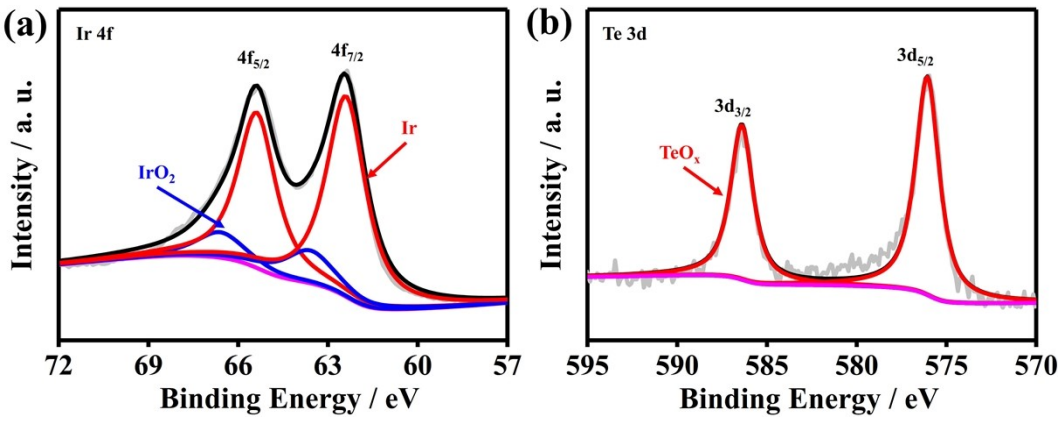

Fig. S11 Ir 4f (a) and Te 3d (b) XPS spectra of IrTe NTs after the stability test.

Table S1. Comparisons of the OER activity for the IrTe NTs and some recently reported catalysts.

Catalysts	Electrolyte	Current density	η (mV)	Ref.
IrTe NTs	**0.5 M H_2SO_4**	**10 mA cm^{-2}**	**271**	**This work**
IrTe NTs	0.1 M $HClO_4$	10 mA cm^{-2}	290	1
Ir WNWs	0.1 M $HClO_4$	10 mA cm^{-2}	280	2
IrNi NCs	0.1 M $HClO_4$	10 mA cm^{-2}	280	3
Ir-Ni oxide	0.1 M $HClO_4$	10 mA cm^{-2}	310	4
Co-IrCu ONC/C	0.1 M $HClO_4$	10 mA cm^{-2}	~293	5
IrNiCu DNF/C	0.1 M $HClO_4$	10 mA cm^{-2}	300	6
IrOx-Ir	0.5 M H_2SO_4	10 mA cm^{-2}	290	7
3D IrRuMn sphere	0.5 M $HClO_4$	10 mA cm^{-2}	260	8
IrNi NFs	0.1 M $HClO_4$	10 mA cm^{-2}	293	9
Ni−Ir NCs	0.05 M H_2SO_4	10 mA cm^{-2}	302	10

Table S2. Comparisons of the HER activity for the IrTe NTs and some recently reported catalysts.

Catalysts	Electrolyte	Current density	η (mV)	Ref.
IrTe NTs	**0.5 M H_2SO_4**	**10 mA cm^{-2}**	**36**	**This work**
IrNi NCs	0.5 M H_2SO_4	20 mA cm^{-2}	32	3
$Ru/C_3N_4/C$	0.5 M H_2SO_4	10 mA cm^{-2}	70	11
Rh/Si	0.5 M H_2SO_4	50 mA cm^{-2}	110	12
Rh-MoS_2	0.5 M H_2SO_4	10 mA cm^{-2}	47	13
CoS|P/CNT	0.5 M H_2SO_4	10 mA cm^{-2}	64	14
$Ni_{0.33}Co_{0.67}S_2$ nanowires	0.5 M H_2SO_4	10 mA cm^{-2}	73	15

Table S3. Comparisons of the overall water splitting performance for the IrTe NTs and some recently reported catalysts.

Catalysts	**Electrolyte**	**Voltage at 10 mA cm^{-2} (V)**	**Ref.**
IrTe NTs	**0.5 M H_2SO_4**	**1.53**	**This work**
Ir-Ag nanotubes	0.5 M H_2SO_4	1.55	16
Ir-SA@Fe@NCNT	0.5 M H_2SO_4	1.51	17
Co-RuIr	0.1 M $HClO_4$	1.52	18
IrNi NCs	0.5 M H_2SO_4	1.58	3
IrCoNi/CFP	0.5 M H_2SO_4	1.56	19
RhCo-ANAs/CF	0.5 M H_2SO_4	1.51	20

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