Electronic Supplementary Material (ESI) for RSC Advances.

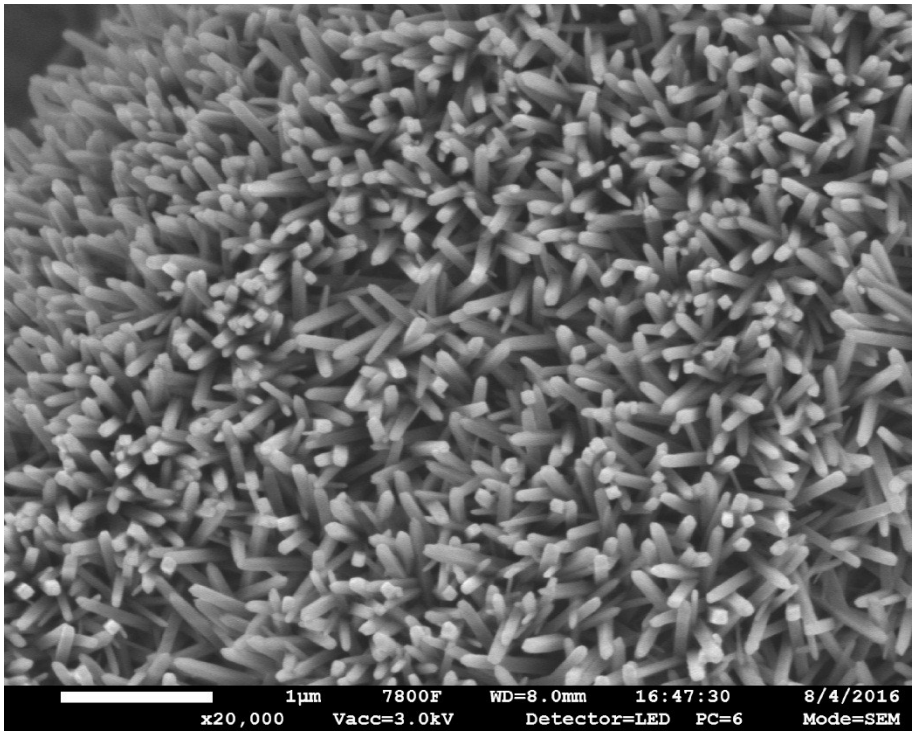

Fig. S1 FESEM image of TiO_2 NRs on a carbon paper

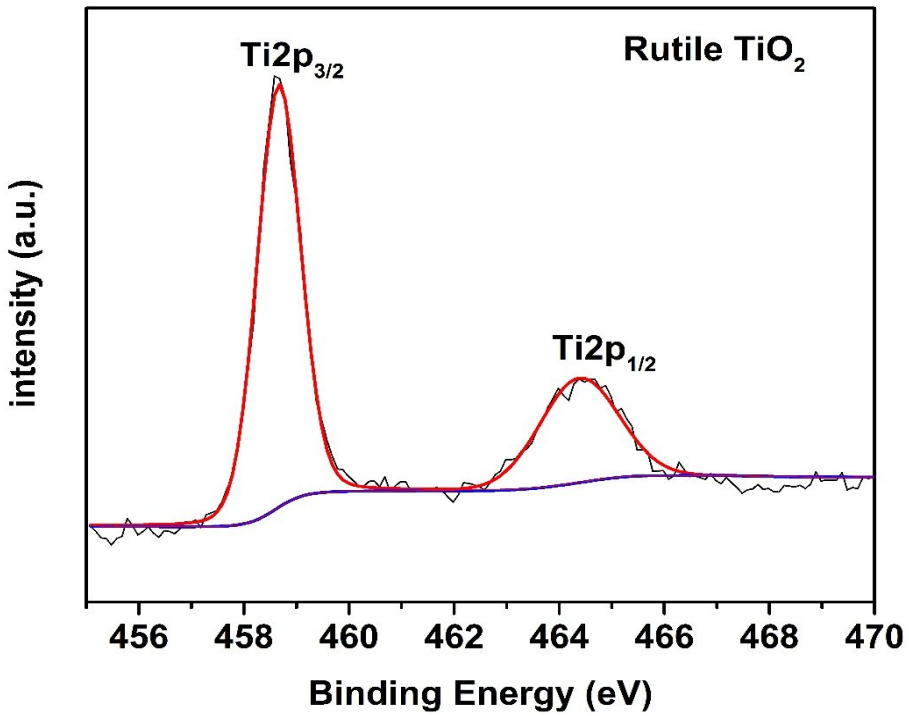

Fig. S2 Ti 2p XPS spectrum of rutile TiO_2.

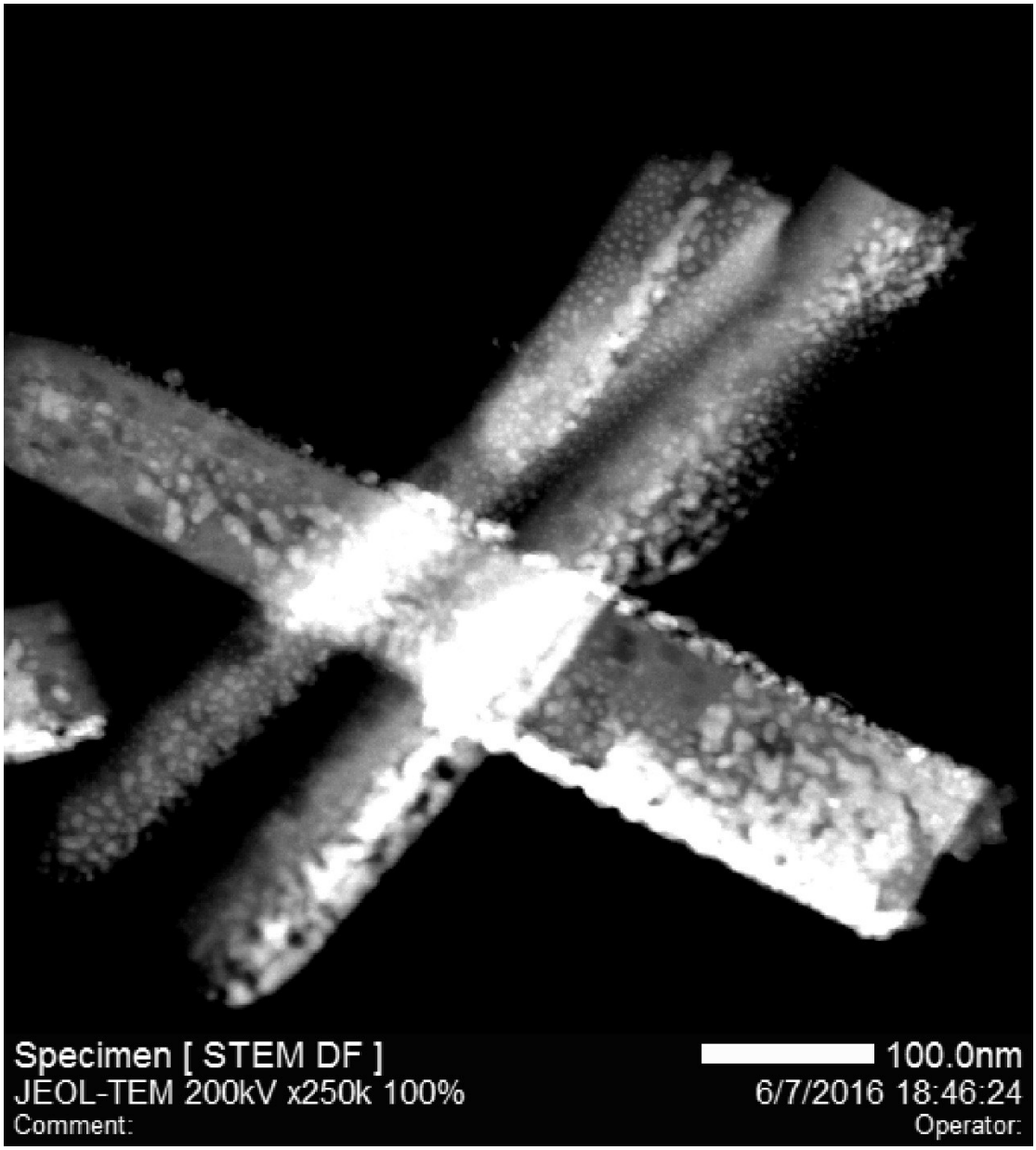

Fig. S3 STEM of PdNi nanoparticles on a TiO_2 nanorods

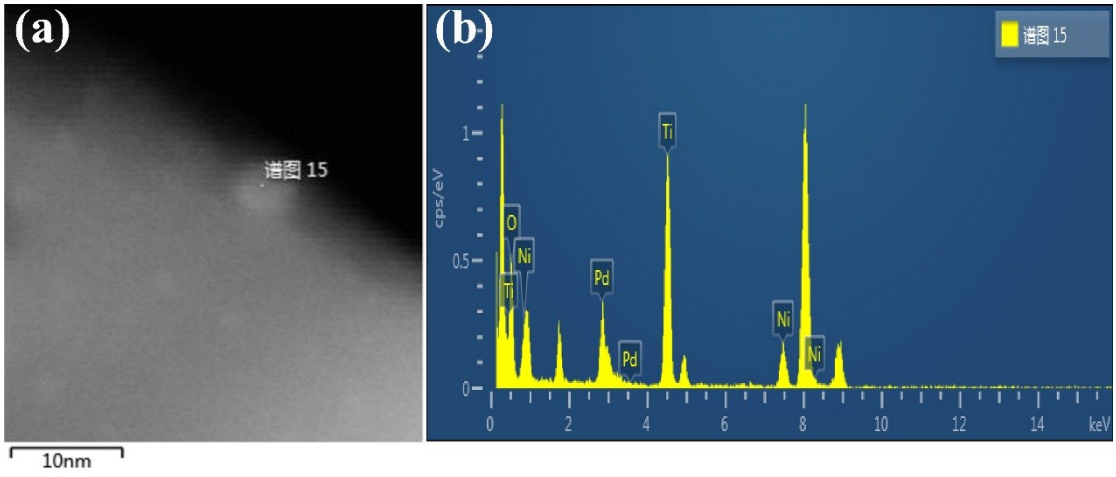

Fig. S4 STEM image (a), and EDX spectrum (b) of the PdNi-TiO_2 NRs

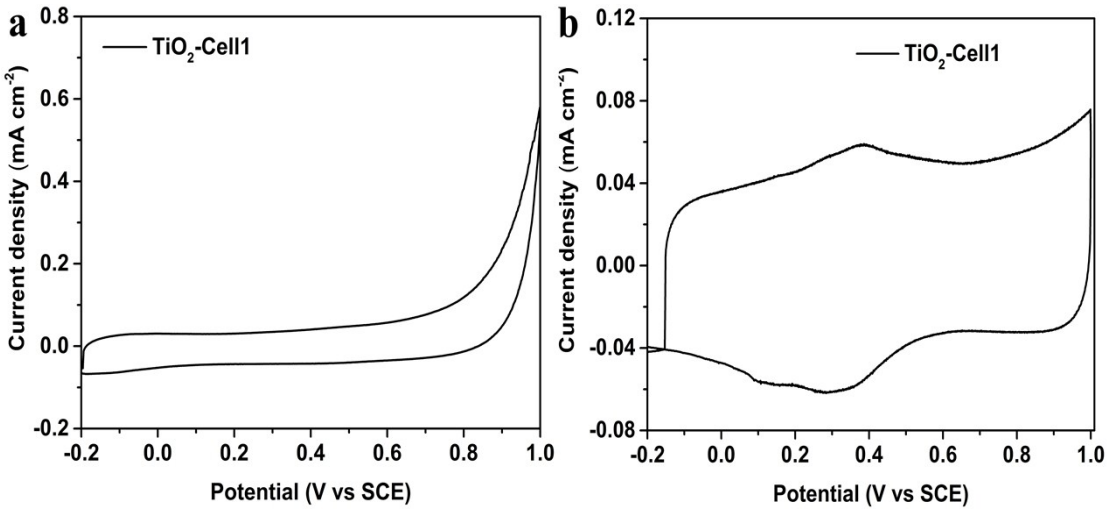

Fig. S5 CVs of TiO_2 sample in 0.5 M H_2SO_4 (a) and 0.5 M H_2SO_4 containing 0.5 M HCOOH at the scan rate of 50 mV s^{-1}.

Table S1 Comparison of the mass activity of the Pd_2Ni_3-TiO_2 with previous reported Pd-based catalysts.

Samples	Test conditions	ECSA ($m^2\ g^{-1}_{Pd}$)	Mass activity ($mA\ mg^{-1}_{Pd}$)	Ref.
Pd_2Ni_3-TiO_2	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**43.6**	**753.1**	**This work**
Pd/NS-G	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**83.4**	**501.8**	**S1[1]**
Pd_6Co/3DG	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**51.0**	**430.8**	**S2[2]**
PdNi/C	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**---**	**556.7**	**S3[3]**
PdNi/C	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**---**	**396**	**S4[4]**
PdCu/C	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**---**	**654**	**S4[4]**
Pd@graphene	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**56.0**	**89.5**	**S5[5]**
Porous $Pd_{57}Ni_{43}$	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**58.4 mC mg^{-1}**	**~800**	**S6[6]**
Pd-NF/C	**0.5 M H_2SO_4 + 0.5 M HCOOH; 20 mV s^{-1}**	**2.47**	**16.4**	**S7[7]**
Pd_1Ni_1-NNs/RGO	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**98.2**	**604.3**	**S8[8]**
AP − Pd/GN	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**72.72**	**446.3**	**S9[9]**
Pd-DNA@Graphene	**0.5 M H_2SO_4 + 0.5 M HCOOH; 50 mV s^{-1}**	**147.1**	**140.1**	**S10[10]**

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