

NJC

## Electronic Supplementary Information

### The metal-support interactions induced catalytic activity enhancement of Pt/TiO<sub>2</sub> for hydrogen production from formic acid

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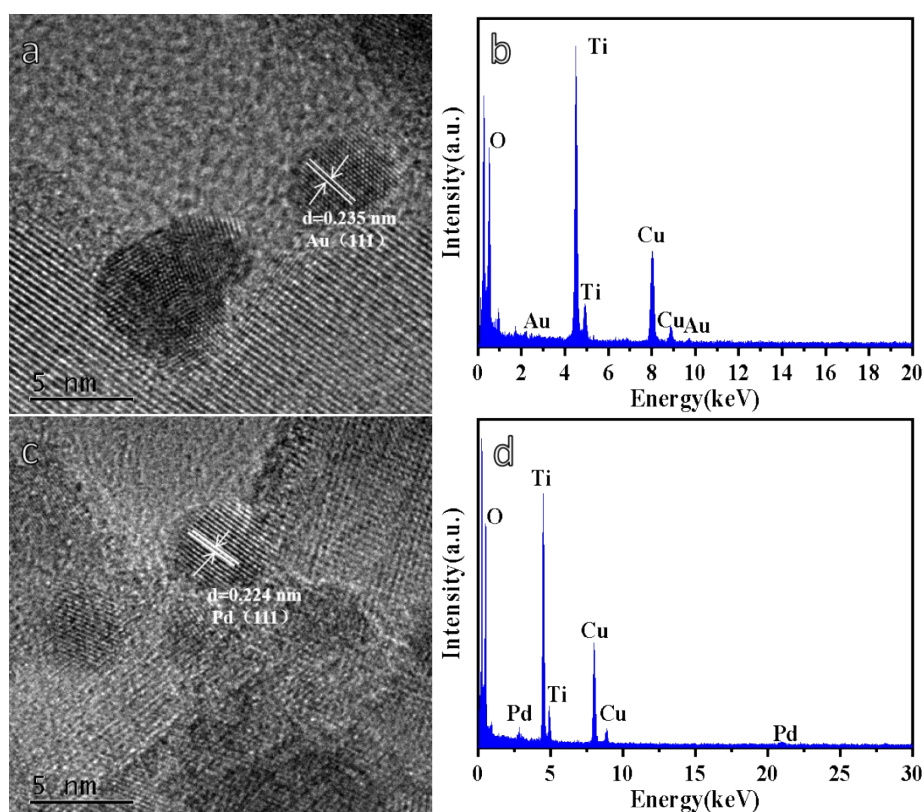
$$TOF = \frac{P_{atm}V}{RTn_{Pt}t}$$

Equation S1

Equation S1 provides insights into the catalytic efficiency of Au/TiO<sub>2</sub>, Pd/TiO<sub>2</sub>, and Pt/TiO<sub>2</sub> based on their turnover frequency (TOF) at a specific conversion level of formic acid to hydrogen. Here,  $P_{atm}$  signifies the ambient pressure (101325 Pa),  $R$  is the universal gas constant (8.314 m<sup>3</sup>·Pa/(mol·K)),  $V$  represents the volume of hydrogen generated,  $n_{Pt}$  denotes the moles of Pt,  $t$  corresponds to a reaction duration of 5 hours, and  $T$  stands for the reaction temperature set at 333K.

**Table S1** Comparison of various catalysts utilized in the dehydrogenation of formic acid.

Catalyst	T/K	Reactants	TOF/h <sup>-1</sup>	Reference
Pd/PPy-S1	333	formic acid and sodium formate	8.60	46
Pd/PPy-S2	333	formic acid and sodium formate	7.40	46
Au/MgAl-LDH	333	formic acid and sodium formate	4.10	47
Pd/C	303	formic acid and sodium formate	36.00	67
Au/TiO <sub>2</sub>	333	formic acid and sodium formate	36.76	This work
Pd/TiO <sub>2</sub>	333	formic acid and sodium formate	28.04	This work
Pt/TiO <sub>2</sub>	333	formic acid and sodium formate	57.83	This work

**Fig. S1** HRTEM images and EDS spectra of Au/TiO<sub>2</sub> (a,b) and Pd/TiO<sub>2</sub> (c,d).

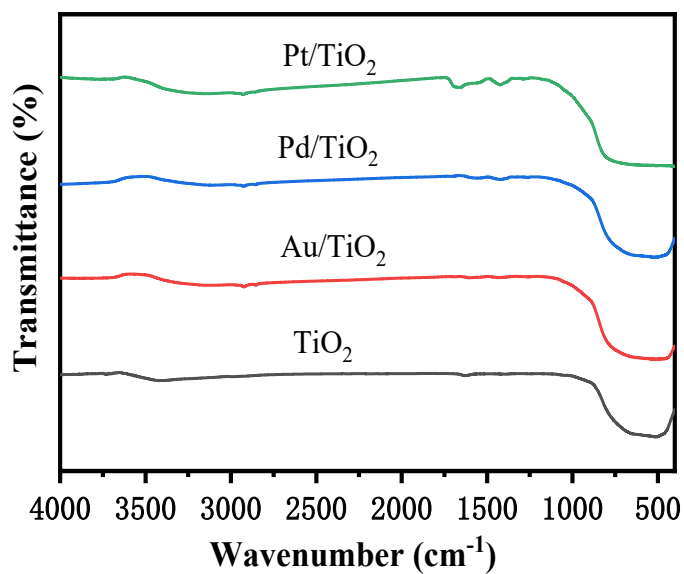


Fig. S2 FT-IR spectra of TiO<sub>2</sub>, Au/TiO<sub>2</sub>, Pd/TiO<sub>2</sub>, and Pt/TiO<sub>2</sub>.

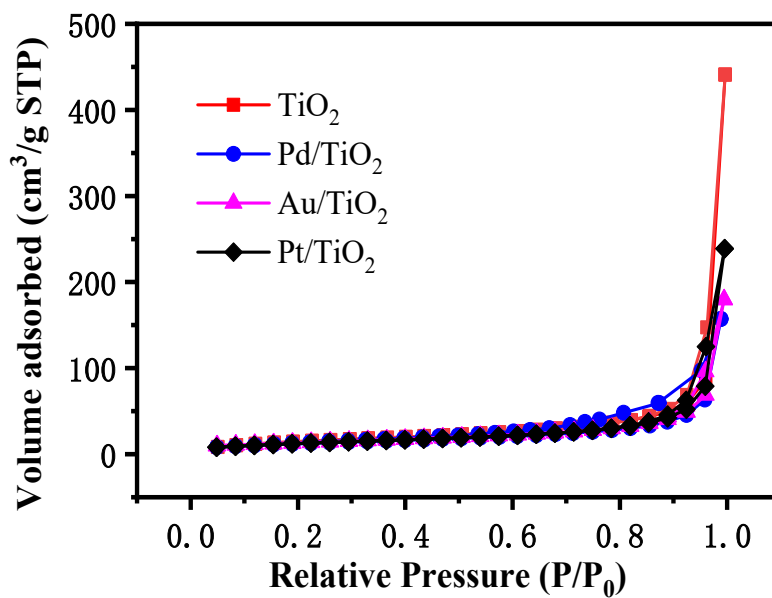


Fig. S3 The N<sub>2</sub> adsorption-desorption isotherms of TiO<sub>2</sub>, Au/TiO<sub>2</sub>, Pd/TiO<sub>2</sub>, Pt/TiO<sub>2</sub>.