## **Supporting Information**

## Temperature-induced variations in photocatalyst properties and photocatalytic hydrogen evolution: Differences in UV, visible and infrared radiation

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Scheme: 1



Figure S1. The electrical impedance changes of electrochemical solution (0.5 M  $Na_2SO_4$ ) with temperature.



Scheme S1. The structure of the Schottky junction.



Figure S2. The UV-vis diffuse reflectance spectra of Pt plate.



**Figure S3.** The PC-HER activities of **a**) 1 wt% Pt-TiO<sub>2</sub> P25, **c**) 1 wt% Pt-g-C<sub>3</sub>N<sub>4</sub> under full-spectrum irradiation and **e**) 1 wt% Pt-g-C<sub>3</sub>N<sub>4</sub> under visible-light (> 420 nm) irradiation. **b**), **d**) and **f**) The corresponding PC-HER rates of Figure 10a, c and e in different half-hour periods.