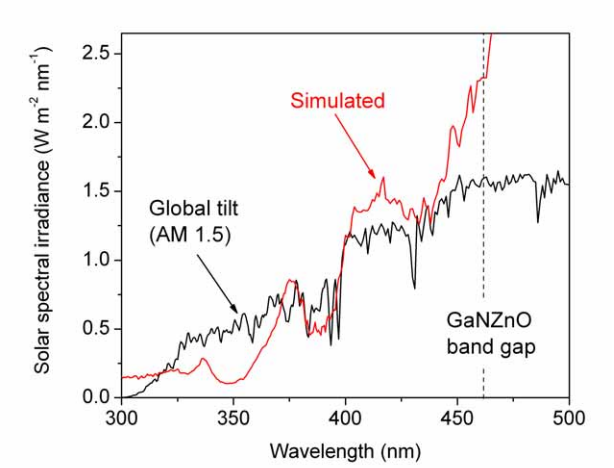

Fig. S1 The global spectral irradiance on the 37° sun facing tilted surface for an absolute air mass of 1.5 as defined by American Society of Testing and Materials (ASTM G173) and our simulated solar irradiance made by an Xe-arc lamp equipped with a neutral density ND0.5 filter, a water filter and an AM 1.5 filter. The integrated irradiance from 300 nm to 462 nm (= 2.68 eV) is equal to 126 W/m^2 for the solar spectrum and 132 W/m^2 for our lamp.

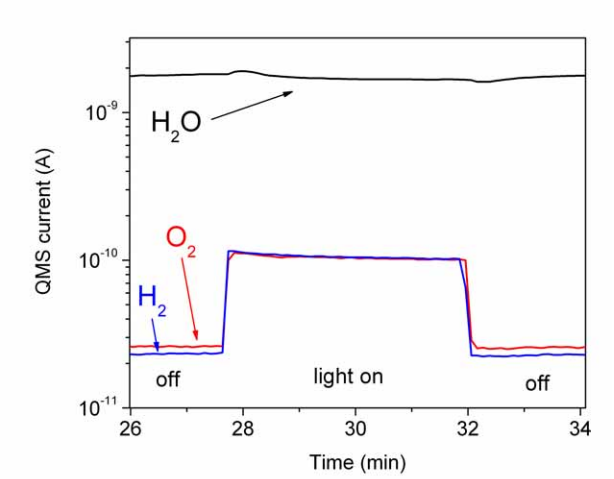

Fig. S2 QMS current for hydrogen molecules (m/z = 2), oxygen molecules (m/z = 32) and water molecules (m/z = 18) as a function of time ([T = 25°C (298K)], blue/violet diode laser array, λ ~ 406 nm, ~ 180 mW/cm^2, ~ 4 minutes light on).

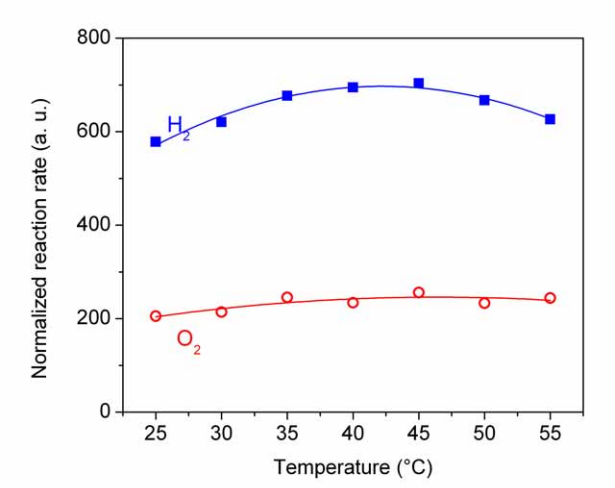

Fig. S3 Initial H_2 and O_2 evolution rates reported in Fig. 4 multiplied by the factor $p^{eq}_{H_2O} / p_{H_2O}$ as a function of temperature. The temperatures were measured with a thermocouple and kept constant with a Peltier element (UV LED, λ ~ 367 nm, ~ 230 mW/cm^2).

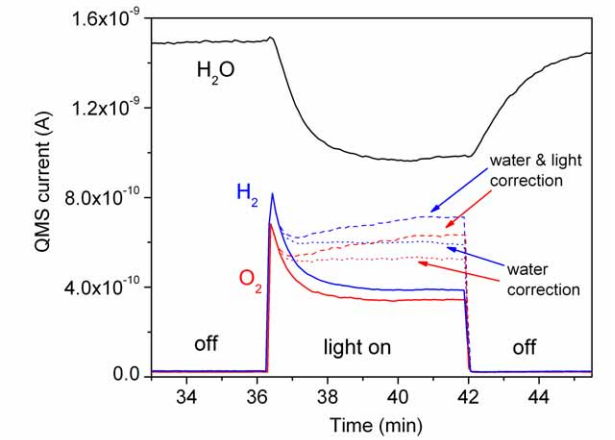

Fig. S4 QMS current for hydrogen molecules (m/z = 2), oxygen molecules (m/z = 32) and water molecules (m/z = 18) as a function of time(solid lines), correction due to the water consumption for the hydrogen and oxygen signals(dotted lines) and the further correction due to the light intensity decay (dashed lines). UV LED, λ ~ 367 nm, ~ 460 mW/cm^2, T = 25°C (298 K), ~ 6 minutes light on.