catalysts

Supplementary Materials: Wastewater Contaminated with Hydrazine as Scavenger Agent for Hydrogen Production by Cu/Ti Nanostructures

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The band gap of the photocatalysts was calculated by linearization of the slope to the X axis (wavelength, nm) with the Y axis (absorbance) equal to zero. For practical purposes, the band gap energy for the different samples was calculated using the follow equation.

$$Eg = (1239 \times m) / (-b) \quad (1)$$

Where m and b are obtained by the linear fit (y = mx + b) of the flat section of the UV–Vis spectrum [1].

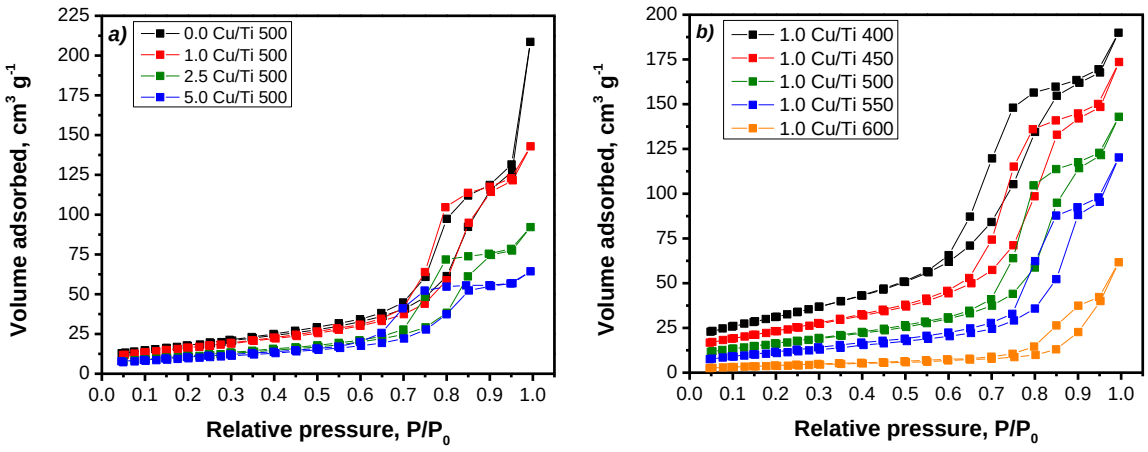

Figure S1. Adsorption – desorption nitrogen isotherms of **a**) different copper loading Cu/Ti calcined at 500 °C, **b**) 1.0 Cu/Ti calcined at different temperatures.

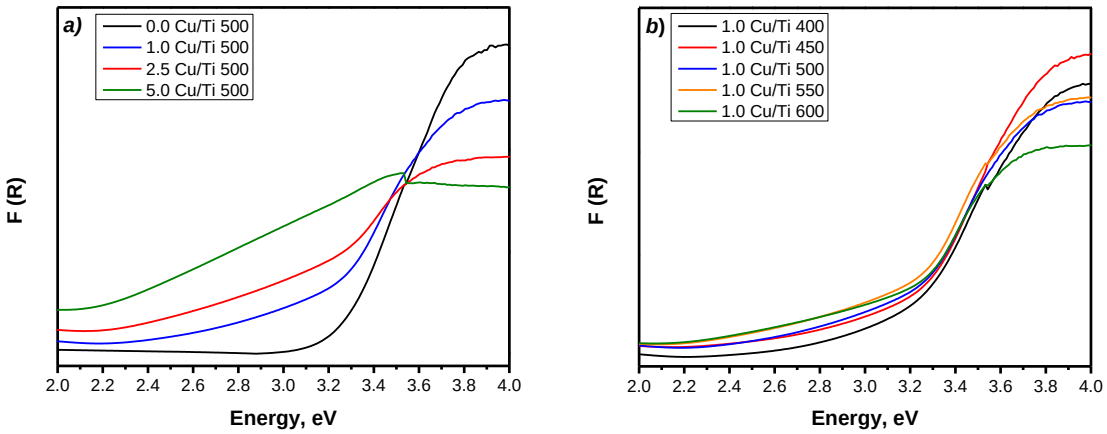

Figure S2. UV-Vis spectra of **a**) different copper loading Cu/Ti calcined at 500 °C, **b**) 1.0 Cu/Ti calcined at different temperatures.

In the follow table S1 are presented some comparative examples of hydrogen production. It is important to mention that the 577.9 μmol g^{-1} h^{-1} of hydrogen produced are in correspondence with the literature. Other copper materials produce 427.8 μmol g^{-1} h^{-1} but using ethanol as scavenger, or other materials with precious metals as Pt produces a similar quantity of 525.7 μmol g^{-1} h^{-1}. On the other hand, gold catalysts produces a grant quantity of hydrogen of 2488 μmol g^{-1} h^{-1} by using similar experimental conditions. In this sense the results here obtained represent a great strategy to produce hydrogen by a hydrazine-wastewater.

Table S1. Some comparative examples of hydrogen production from current literature using several transition metals.

Material	Scavenger	Light source	H_2 produced (μmol g^{-1} h^{-1})	Reference
0.05 Pt/TiO_2	Pure water	250W high-pressure Hg lamp	525.7	[2]
Cu_2O/TiO_2	Methanol	300 W Xe lamp	985	[3]
Ag/$SrTiO_3$	Ethanol	UV lamp (254 nm)	400	[4]
Cu@NT	Ethanol	UV lamp (254 nm)	427.8	[5]
Au/TiO_2	Methanol	UV lamp 348/395 nm	2488	[6]
1-Cu/TiO_2	Hydrazine	UV lamp (254 nm)	577.8	This work

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