catalysts

MDPI

Supplementary Material

Turning Carbon Dioxide and Ethane into Ethanol by Solar-Driven Heterogeneous Photocatalysis over RuO_2- and NiO-co-doped $SrTiO_3$

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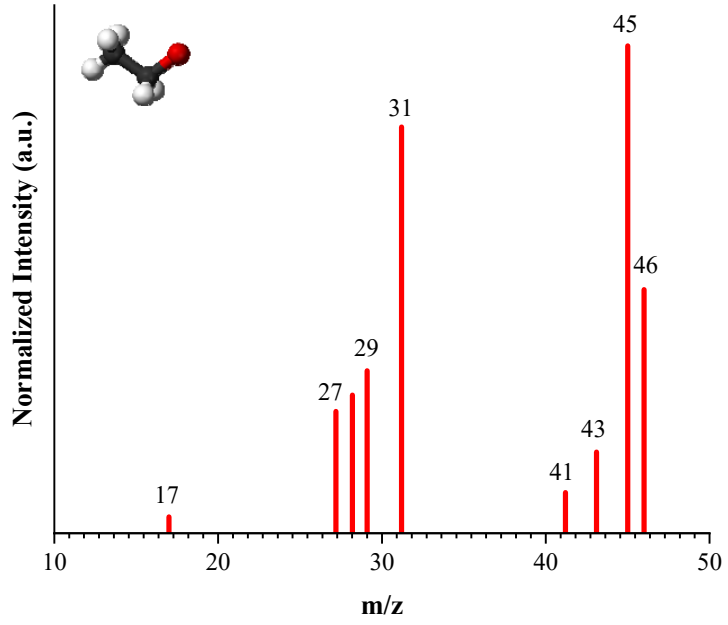
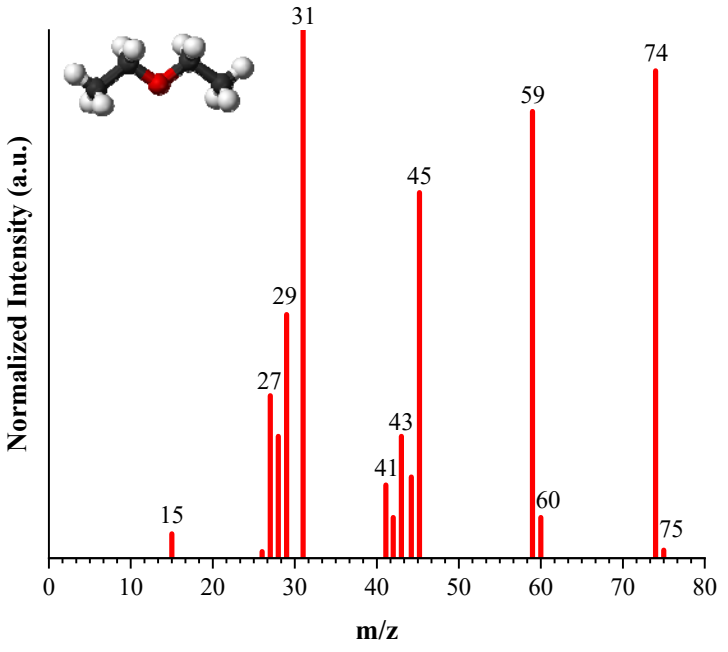
Results and Discussion



(a)



(b)

Figure S1. Mass spectra of the by-products obtained from the thermo-photocatalytic reaction of 18CO2with C2H6over SrTiO3:RuO2:NiO catalyst, namely: (a) ethanol; and (b) diethyl ether. Expe-ri-19mental conditions: 20 mg of SrTiO3:RuO2:NiO; [Ru]:[Ni] = 1:1 (molar); Ru = 0.8 wt. %; PC2H6= 1.01 20bar; PCO2= 0.35 bar; T = 200 ºC and I = 1000 W m-2. Equipment: Agilent 5973 inert Gas Chromato-21graph/Mass Spectrometer;electronic ionization, positive ion mode.

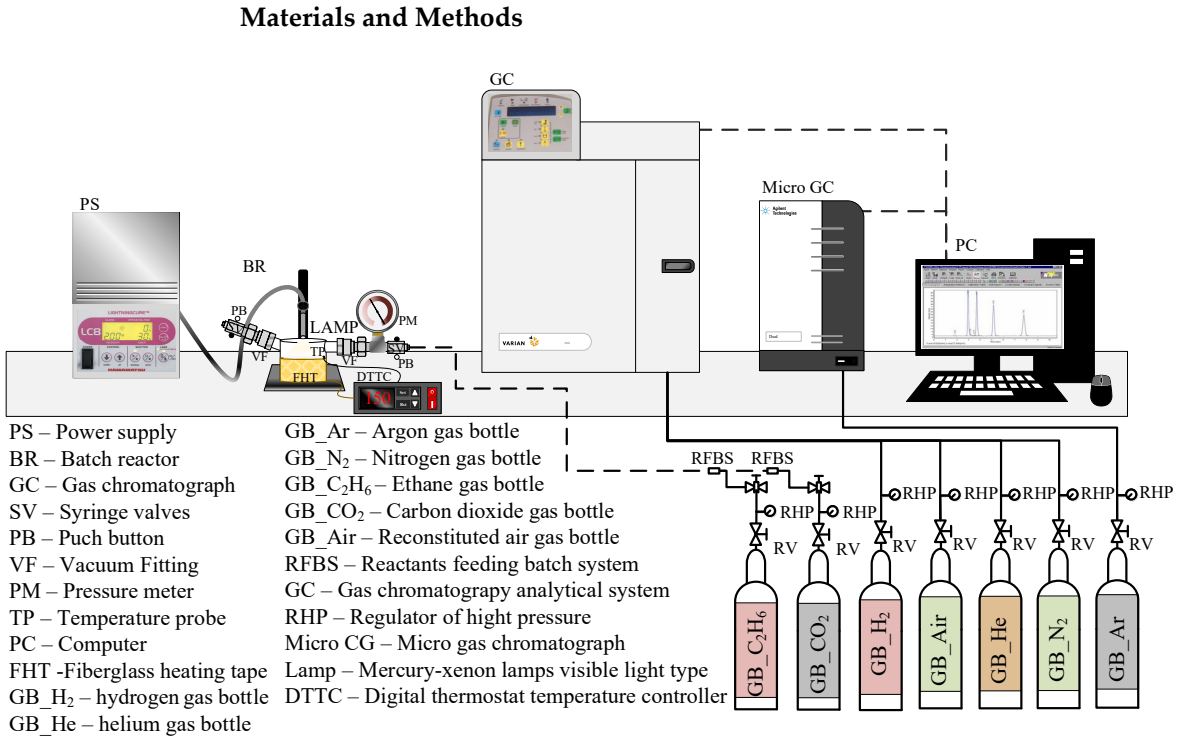


Figure S2. Schematic representation of the batch photocatalytic system.

Table S1. Concentration of Ru and Ni elements (wt.%) in the photocatalyst assessed by ICP–OES analysis (after aqua regia extraction).

Catalyst	Ru (wt.%)	[Ru]:[Ni] molar ratio	ICP analysis	
			Ru (wt.%)	Ni (wt.%)
$SrTiO_3$:RuO_2	0.8	1:0	0.7878	-
$SrTiO_3$:RuO_2:NiO	0.2	1:1	0.1667	0.0779
	0.4	1:1	0.3622	0.2114
		1:0.3		0.1913
	0.8	1:1	0.7878	0.4570
		1:2		0.9241