Supporting information

In situ α-Fe_2O_3 modified $La_2Ti_2O_7$ for enhanced photocatalytic CO_2 reduction activity

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Figure captions

Table S1 The Fe content in the as-prepared α-Fe_2O_3/LTO composites

Samples	Fe content (wt.%)	Calculated α-Fe_2O_3 content (wt.%)
1 wt.% α-Fe_2O_3/LTO	0.59	0.84
3 wt.% α-Fe_2O_3/LTO	1.83	2.61
6 wt.% α-Fe_2O_3/LTO	3.97	5.67

Table S2 The physical adsorption capacity of LTO and α-Fe_2O_3/LTO

Sample	S_{BET} (m^2/g)	Q_{CO2} (cm^3/g)	Q_{CO2}/S_{BET} (cm^3/m^2)
LTO	52.9	10.7	0.202
α-Fe_2O_3/LTO	40.4	8.1	0.201

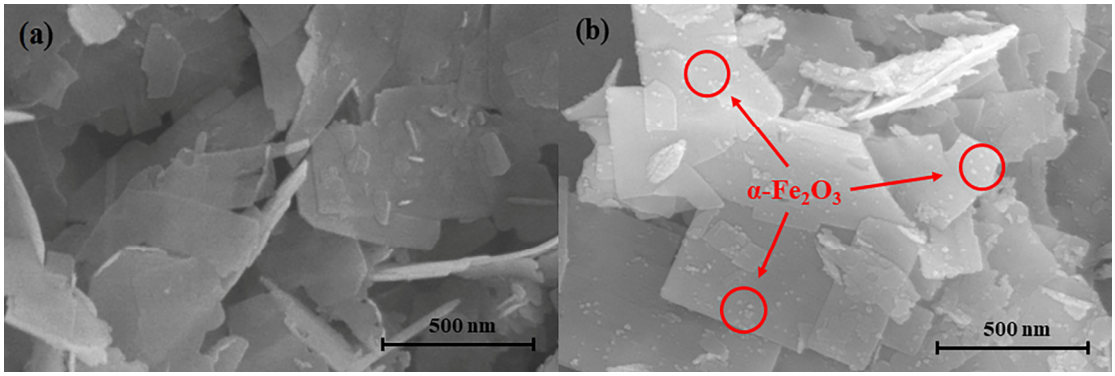

Figure S1 The SEM images of LTO and α-Fe_2O_3/LTO samples

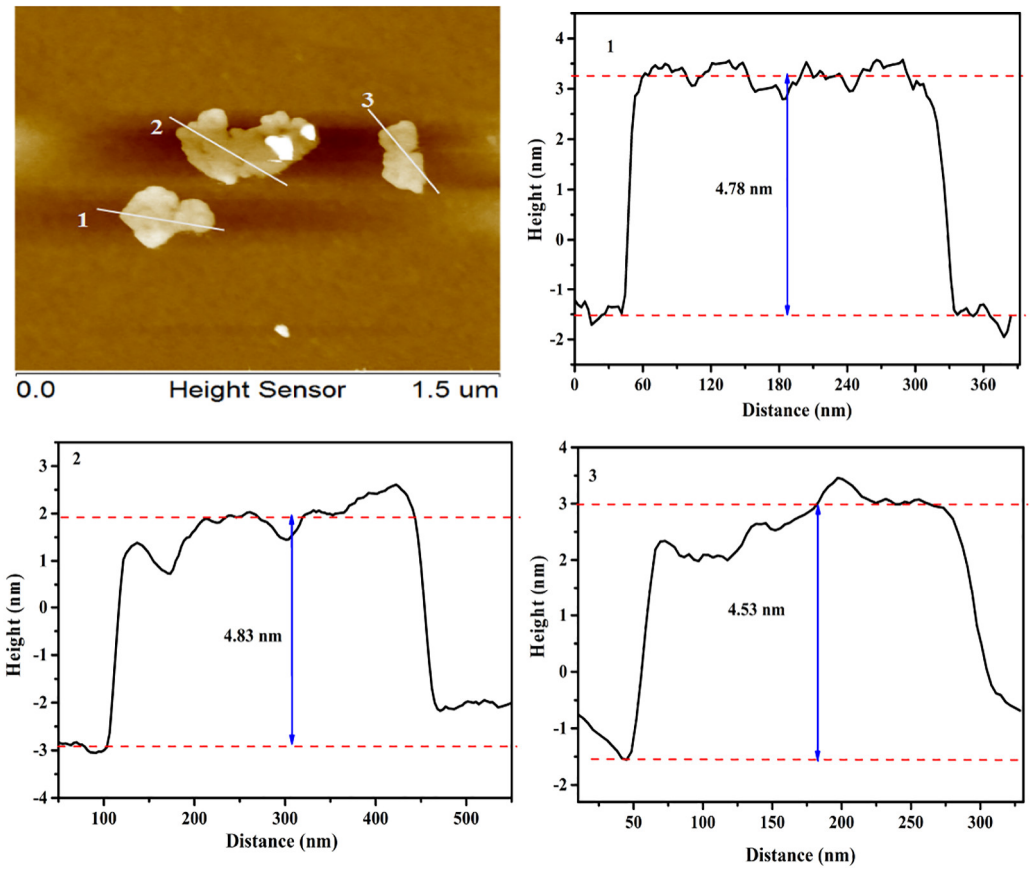

Figure S2 AFM images of the LTO sample

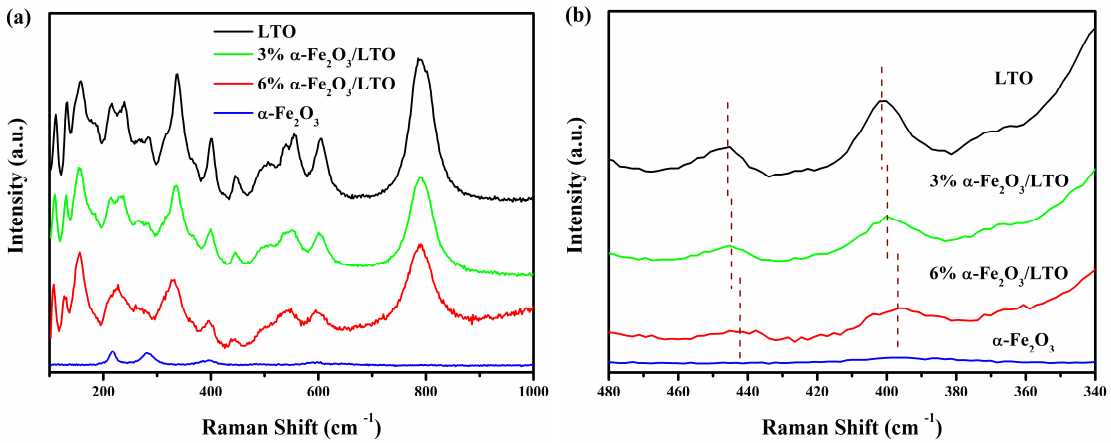

Figure S3 (a) Raman spectra and (b) Fine Raman spectra of different samples.

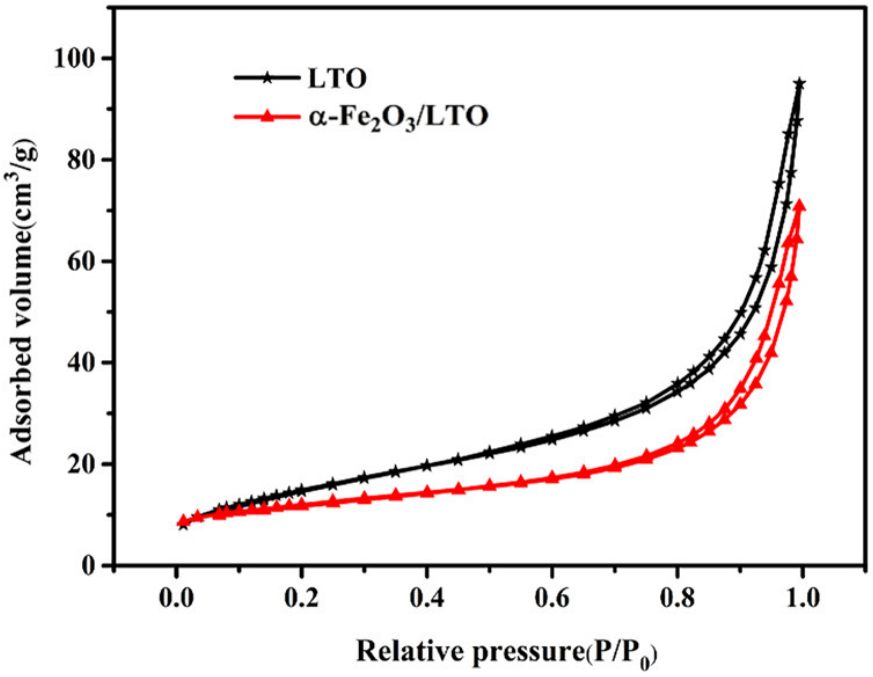

Figure S4 N_2 adsorption-desorption isotherms of LTO and α-Fe_2O_3/LTO samples.

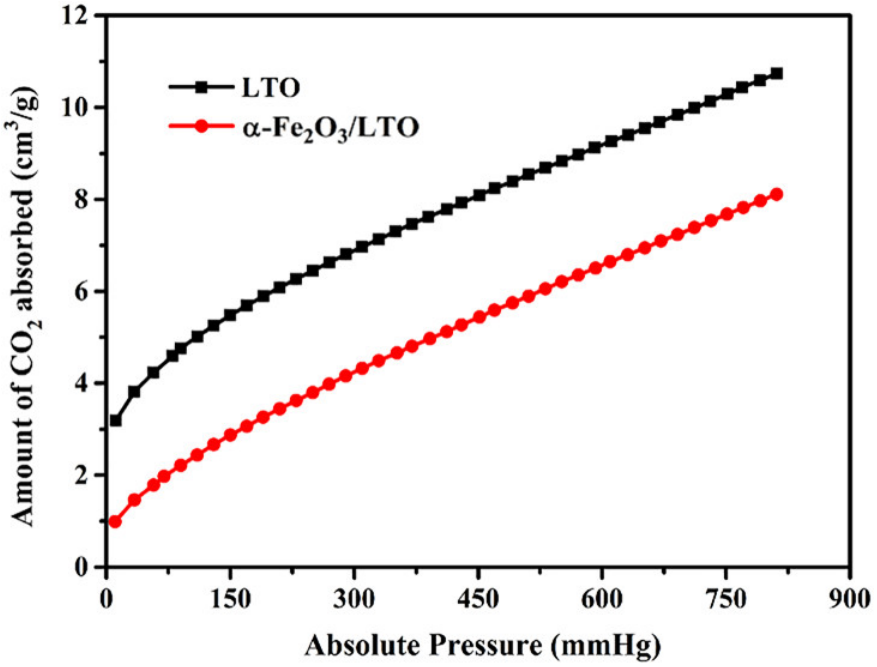

Figure S5 CO_2 adsorption isotherm of LTO and α-Fe_2O_3/LTO samples

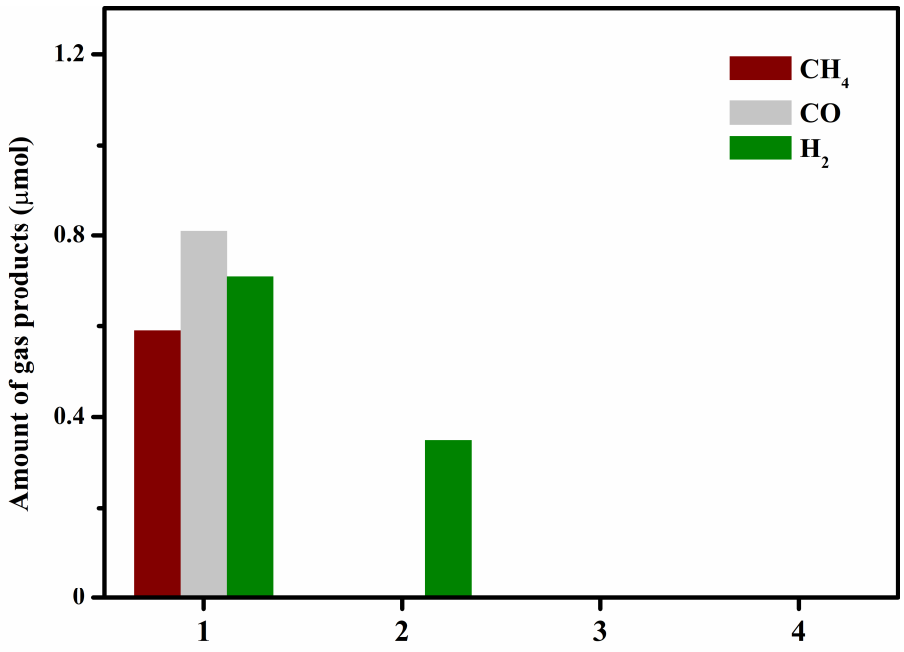

Figure S6 Control experiments for photocatalytic CO_2 reduction over α-Fe_2O_3/LTO sample. Reaction conditions: 1. 20 mg of α-Fe_2O_3/LTO catalyst, 140 mL saturated CO_2 solution, irradiate for 5h with 125W mercury lamp; 2. without CO_2 (Ar atmosphere); 3. without catalyst; 4. without lamp irradiation.

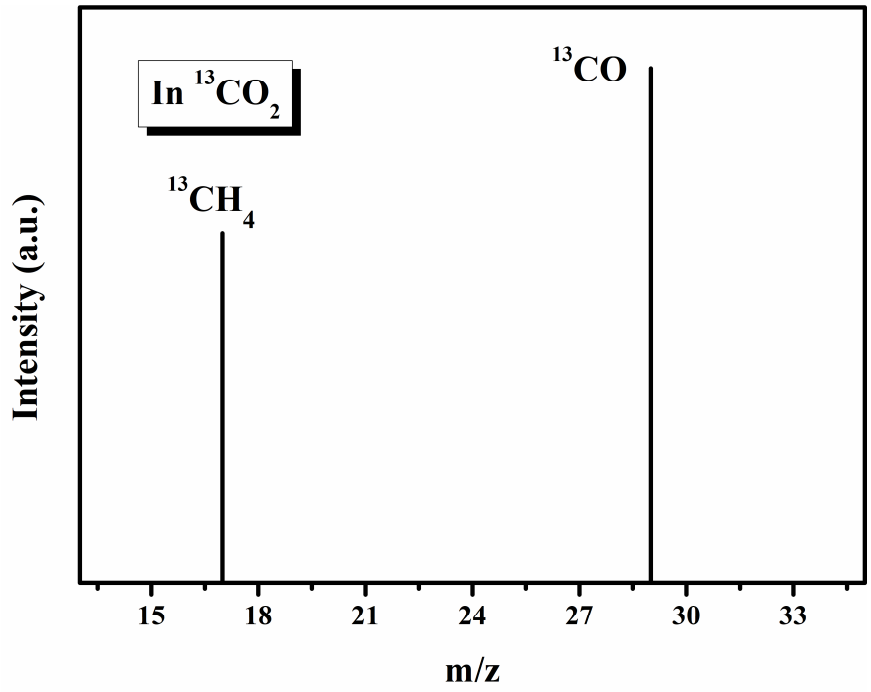

Figure S7 Mass spectra of CH_4 and CO from photocatalytic reduction of CO_2 over α-Fe_2O_3/LTO sample.

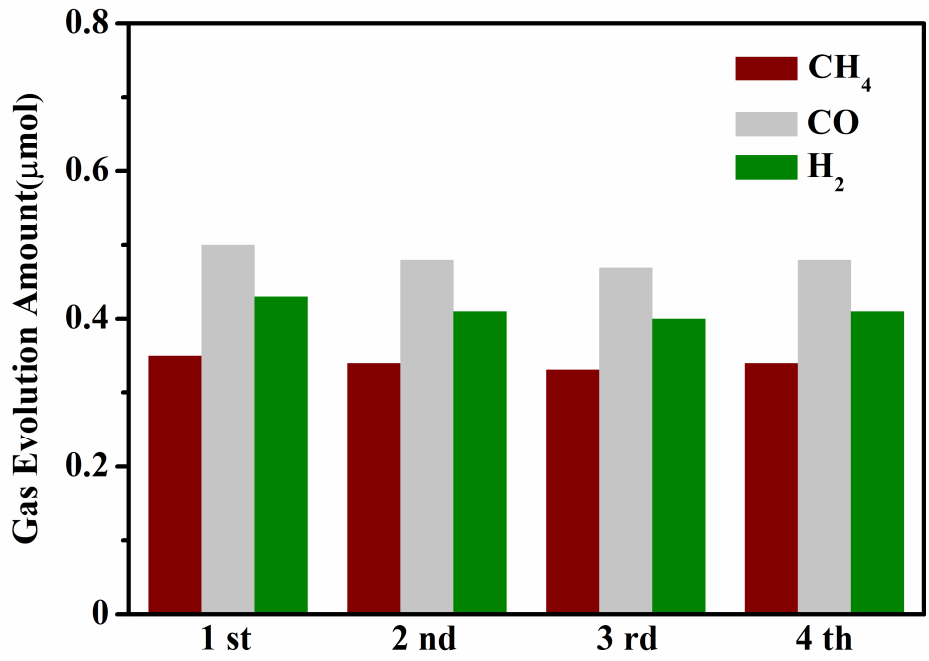

Figure S8 Recycling stability tests over α-Fe_2O_3/LTO sample (3h per cycle).

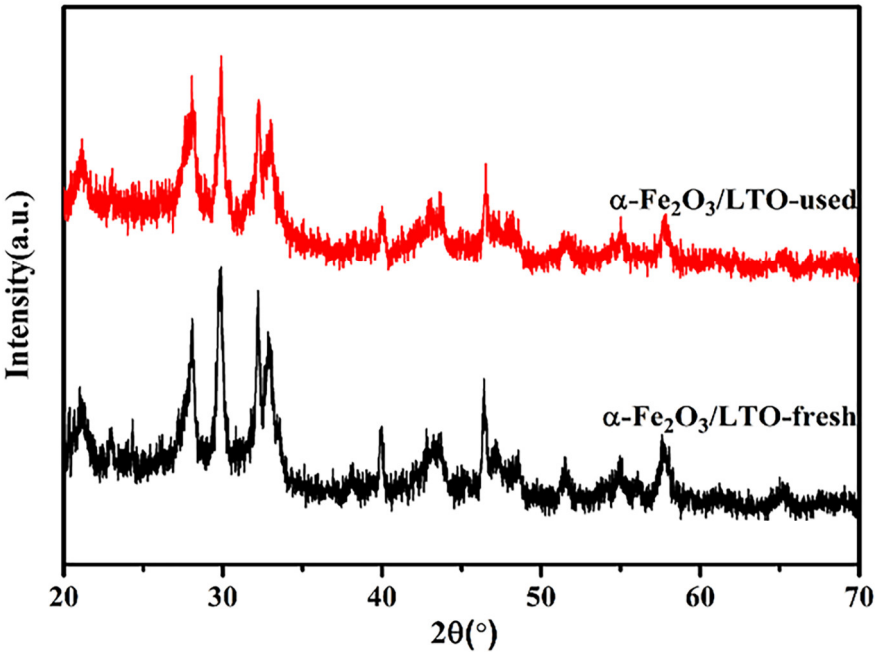

Figure S9 XRD pattern of α-Fe_2O_3/LTO before and after cycling test.

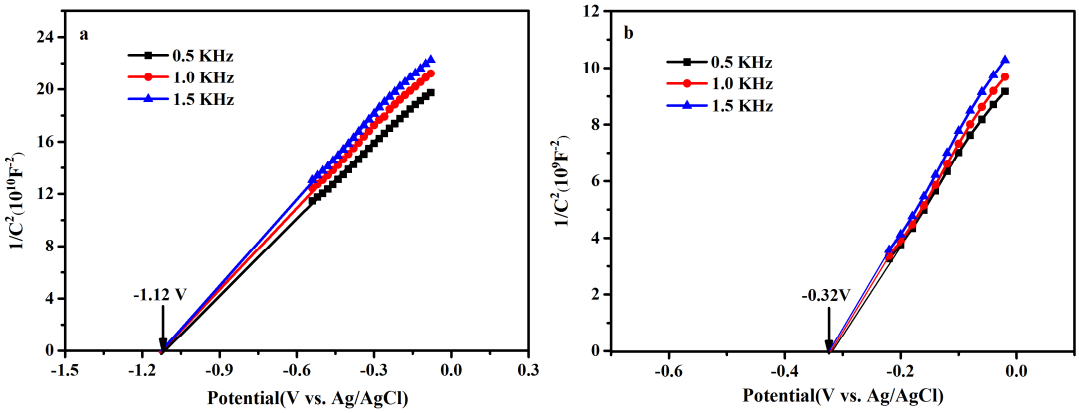

Figure S10 Mott-Schottky plots of (a) LTO and (b) α-Fe_2O_3 samples.

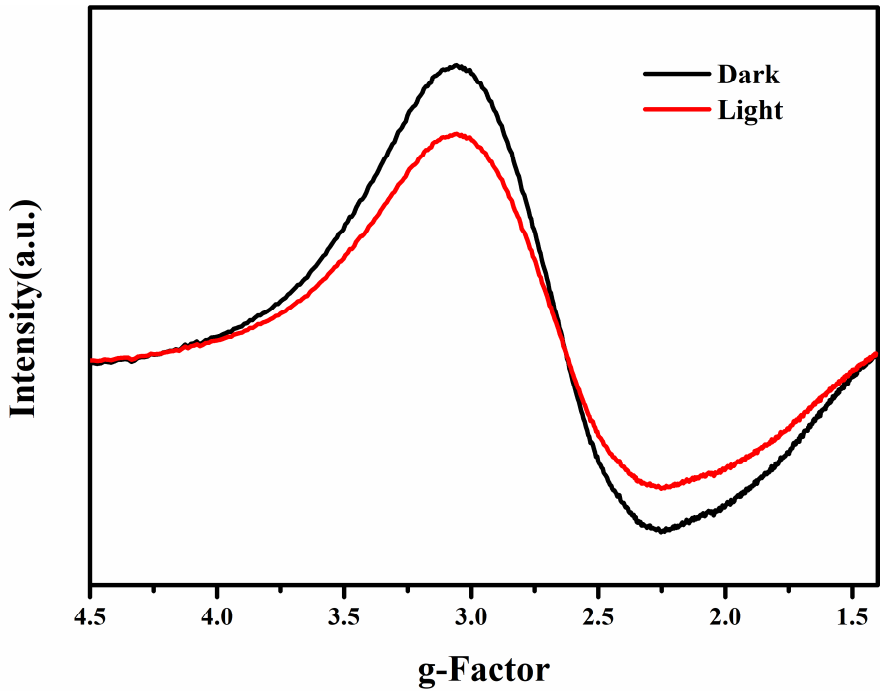

Fig. S11 EPR spectra of the α-Fe_2O_3/LTO samples in dark and light conditions.