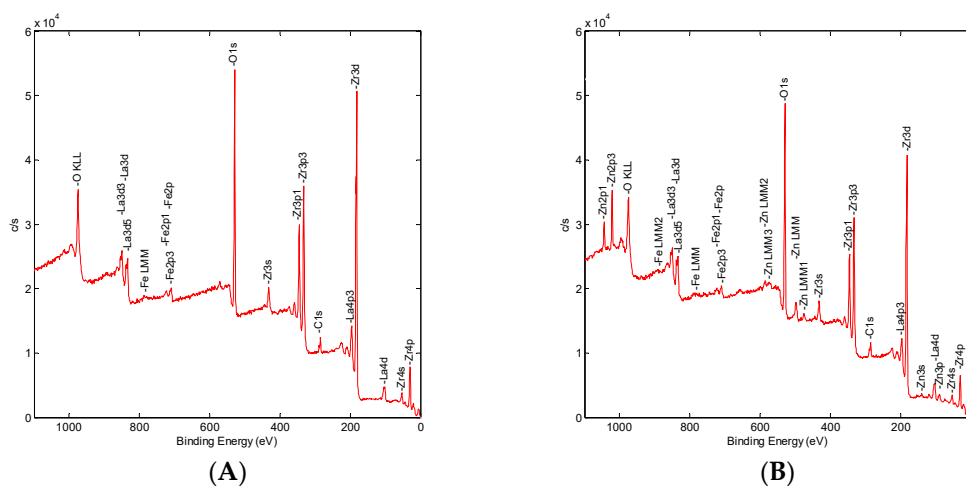


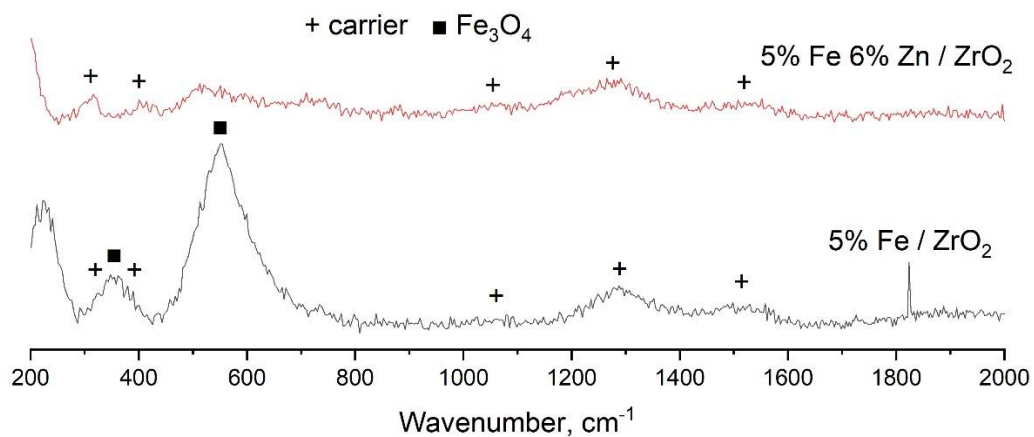
## Supplementary Materials:

**Table S1.** Characteristics of the used catalyst carrier  $\text{ZrO}_2$ .

Manufacturer	Saint-Gobain
Compound	70–100 % $\text{ZrO}_2$ + 5–15% $\text{La}_2\text{O}_3$
Surface area $S_{\text{BET}}$ , $\text{m}^2/\text{g}$	108
Pore volume $V_{\text{total}}$ , $\text{cm}^3/\text{g}$	0.234
Mesopore volume $V_{\text{meso}}$ , $\text{cm}^3/\text{g}$	0.234
Granule size, mm	0.25–0.50
Bulk density, $\text{g}/\text{cm}^3$	1.3



**Figure S1.** XPS spectra of catalyst samples 5%Fe/ $\text{ZrO}_2$  (A) and 5%Fe6%Zn/ $\text{ZrO}_2$  (B).



**Figure S2.** Raman spectra for the spent catalysts after the  $\text{CO}_2$  hydrogenation.