

Supplementary Information

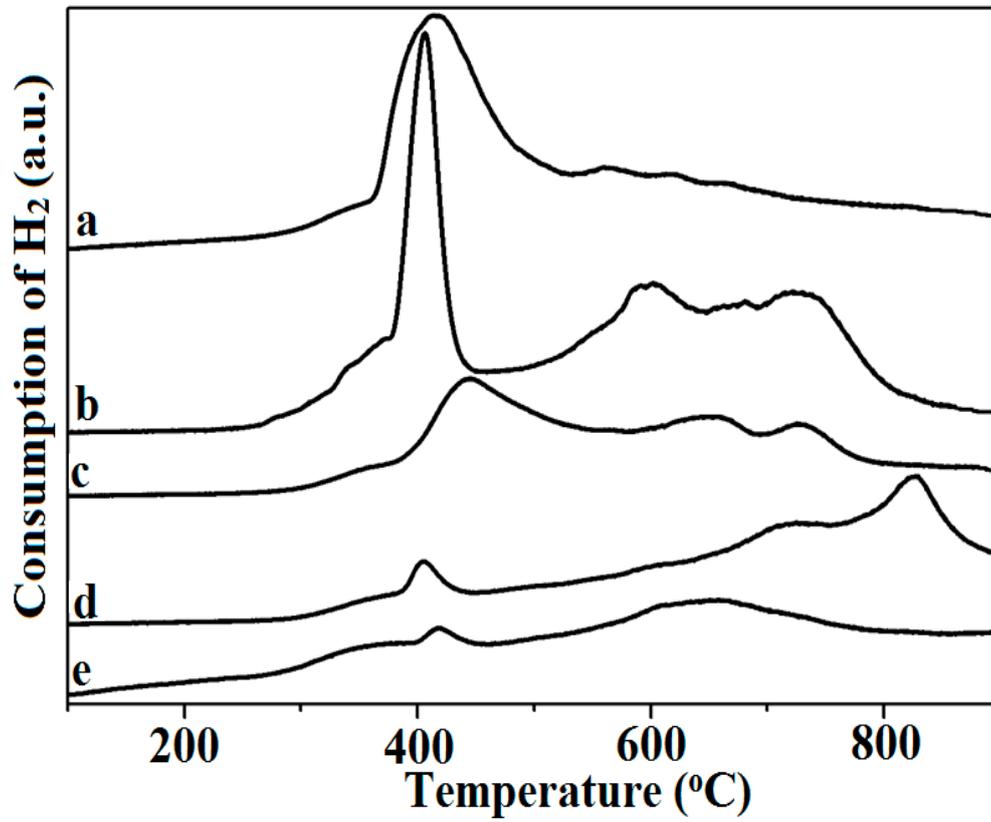


Figure S1. TPR Profiles of $\text{LaNi}_x\text{Zr}_{1-x}\text{O}_3$ catalysts synthesized by sol-gel method. a) $x = 0.8$, b) $x = 0.6$, c) $x = 0.4$, d) $x = 0.3$, and e) $x = 0.2$.

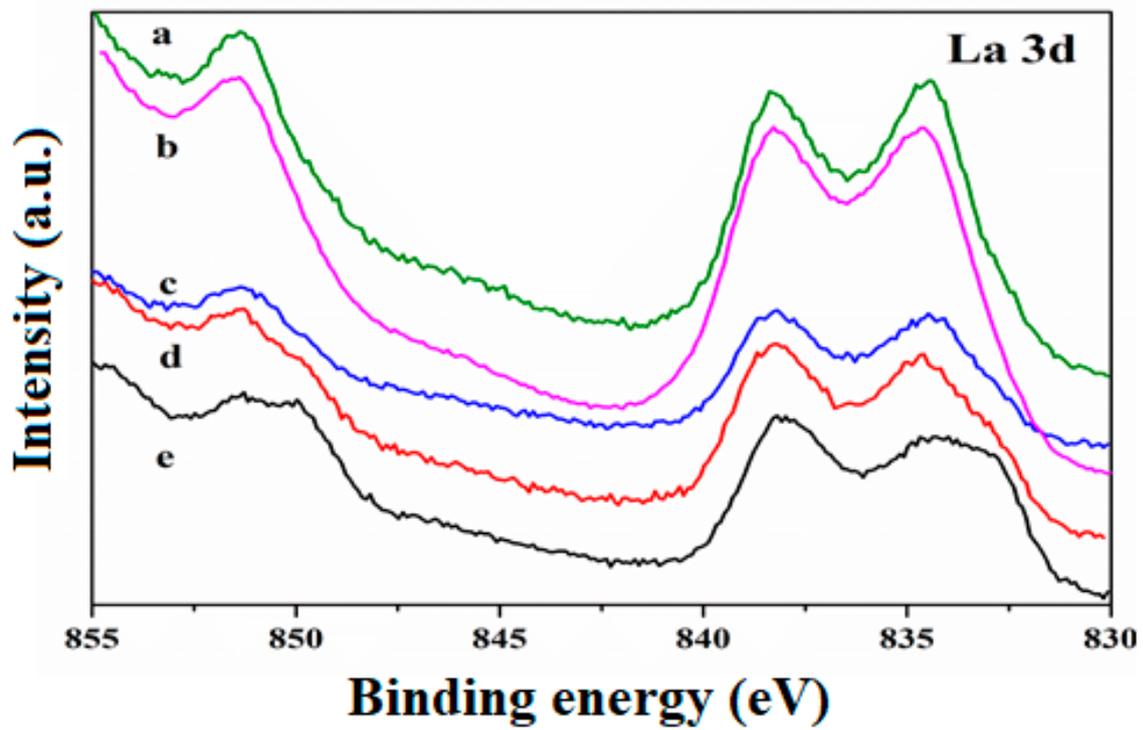


Figure S2. La 3d Core level spectra of $\text{LaNi}_x\text{Zr}_{1-x}\text{O}_3$ catalysts synthesized by sol-gel method. a) $x = 0.8$, b) $x = 0.6$, c) $x = 0.4$, d) $x = 0.3$ and e) $x = 0.2$.

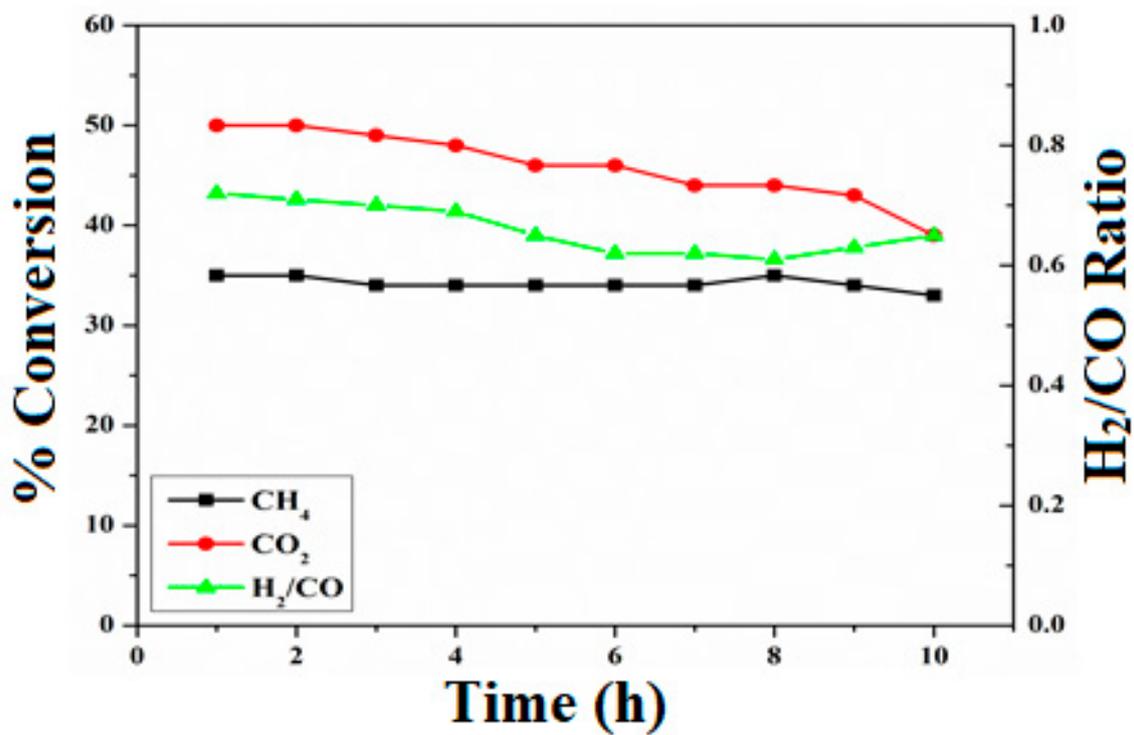


Figure S3. Time on stream study of LaNi_{0.8}Zr_{0.2}O₃ catalysts synthesized by sol-gel method during DRM reaction at 800 °C.

Table S1. Carbon formation during the DRM reaction on $\text{LaNi}_x\text{Zr}_{1-x}\text{O}_3$ catalysts synthesized by sol-gel method.

S. No.	Catalyst	Carbon (%)
1	$\text{LaNi}_{0.2}\text{Zr}_{0.8}\text{O}_3$	13.14
2	$\text{LaNi}_{0.3}\text{Zr}_{0.7}\text{O}_3$	7.89
3	$\text{LaNi}_{0.4}\text{Zr}_{0.6}\text{O}_3$	5.93
4	$\text{LaNi}_{0.6}\text{Zr}_{0.4}\text{O}_3$	3.56
5	$\text{LaNi}_{0.8}\text{Zr}_{0.2}\text{O}_3$	3.51