

Supplementary Information

Enhancement of Hydrogen Production via Methanol Steam Reforming Using Ni-based Catalyst Supported by Spongy Mesoporous Alumina

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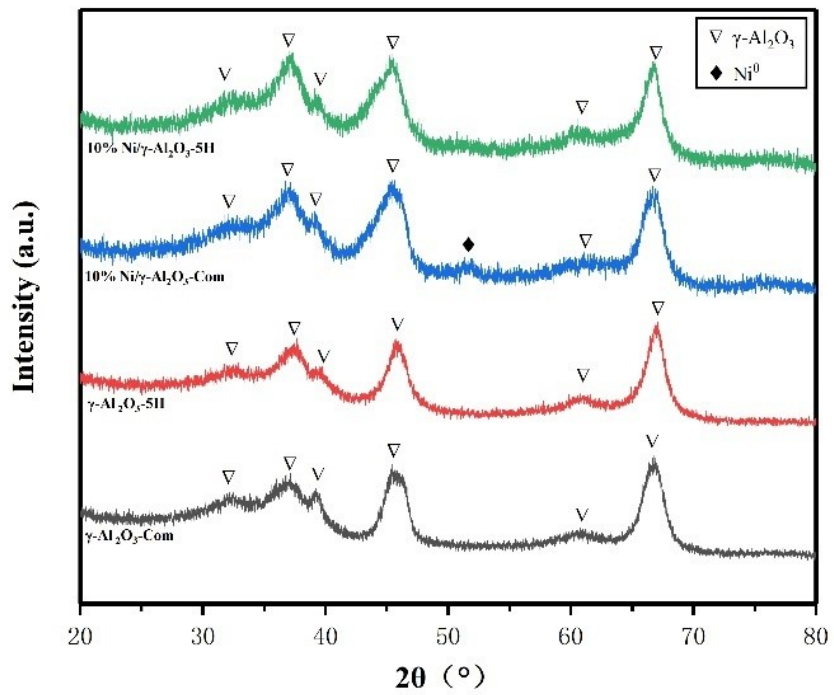


Fig. S1. XRD spectrum of the $\gamma\text{-Al}_2\text{O}_3$ supports and Ni/ $\gamma\text{-Al}_2\text{O}_3$ catalysts.

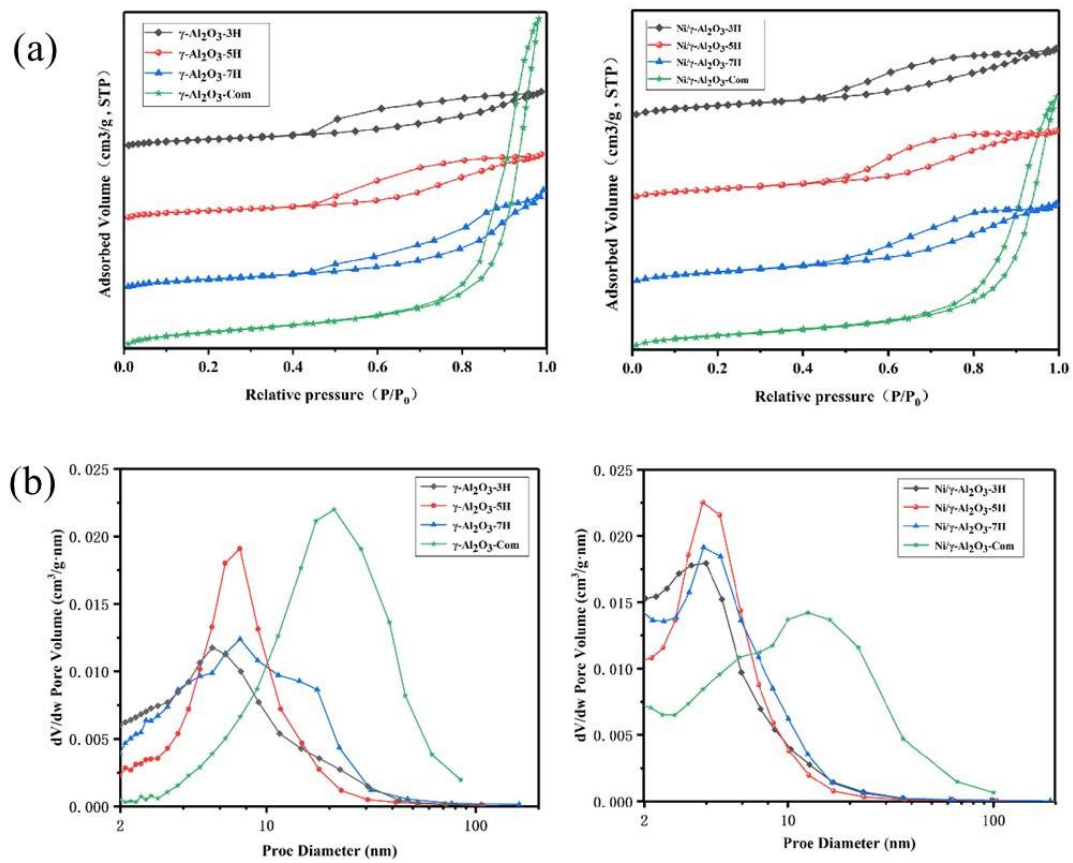


Fig. S2. The N_2 adsorption-desorption isotherms and the corresponding pore size distributions of γ - Al_2O_3 -3H/5H/7H/Com supports and Ni/ γ - Al_2O_3 -3H/5H/7H/Com catalysts.

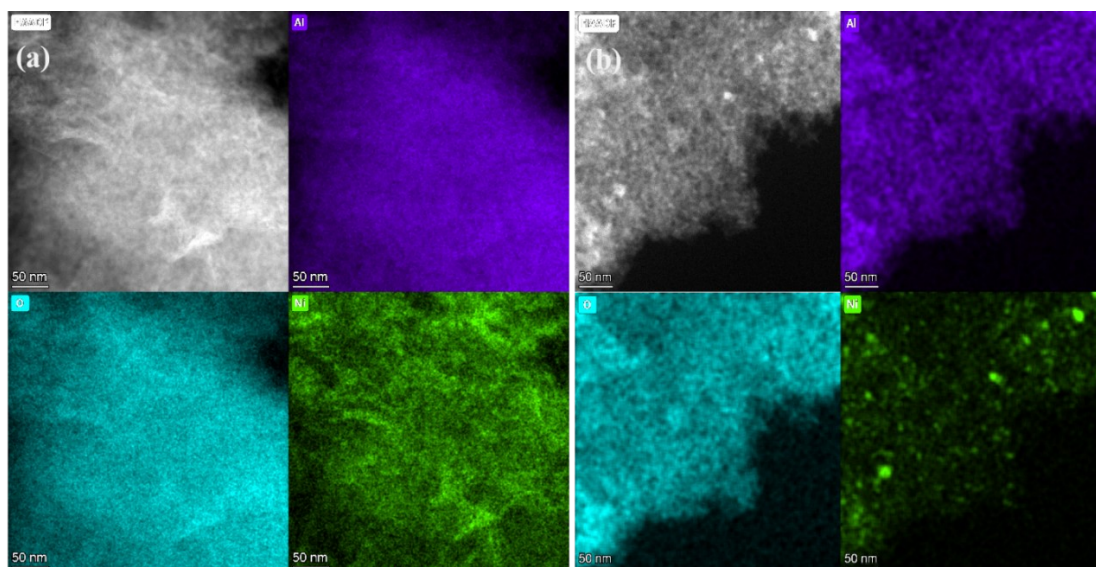


Fig. S3. TEM-EDS images of the (a,b) Ni/γ-Al₂O₃-5H and (c,d) Ni/γ-Al₂O₃-Com catalysts.

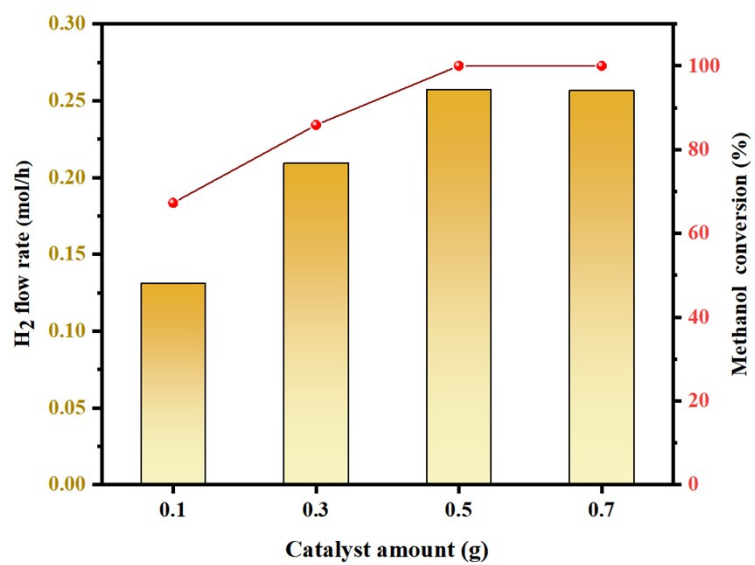


Fig. S4. The effect of catalyst amounts on the methanol steam reforming to hydrogen was examined at the temperature of 450 °C over Ni/ γ -Al₂O₃-5H catalyst.

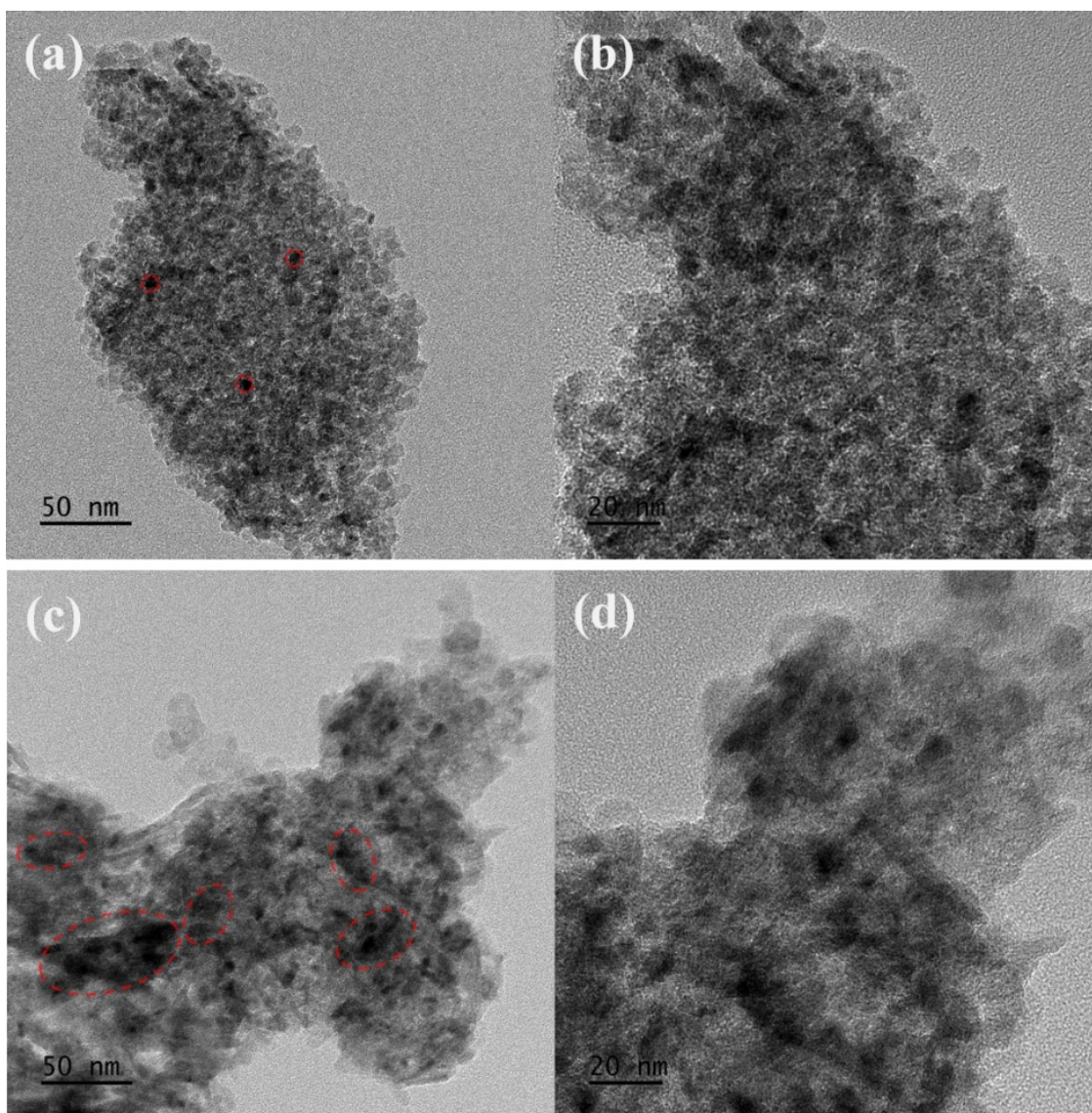


Fig. S6. TEM images of the (a,b) spent Ni/ γ -Al₂O₃-5H and (c,d) spent Ni/ γ -Al₂O₃-Com catalysts

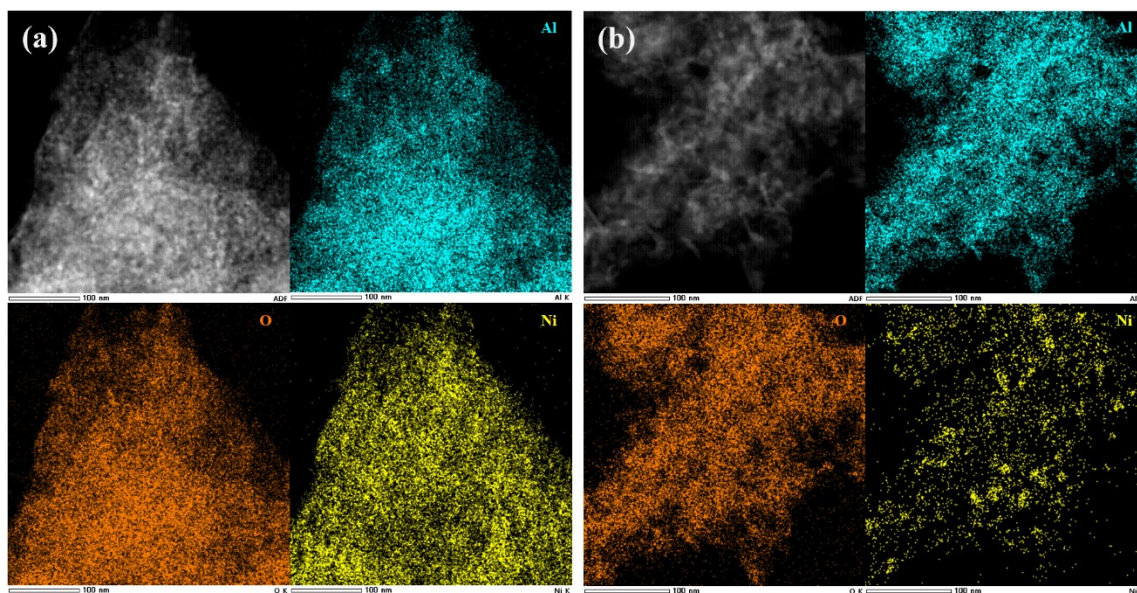


Fig. S7. TEM-EDS images of the (a,b) spent Ni/γ-Al₂O₃-5H and (c,d) spent Ni/γ-Al₂O₃-Com catalysts.

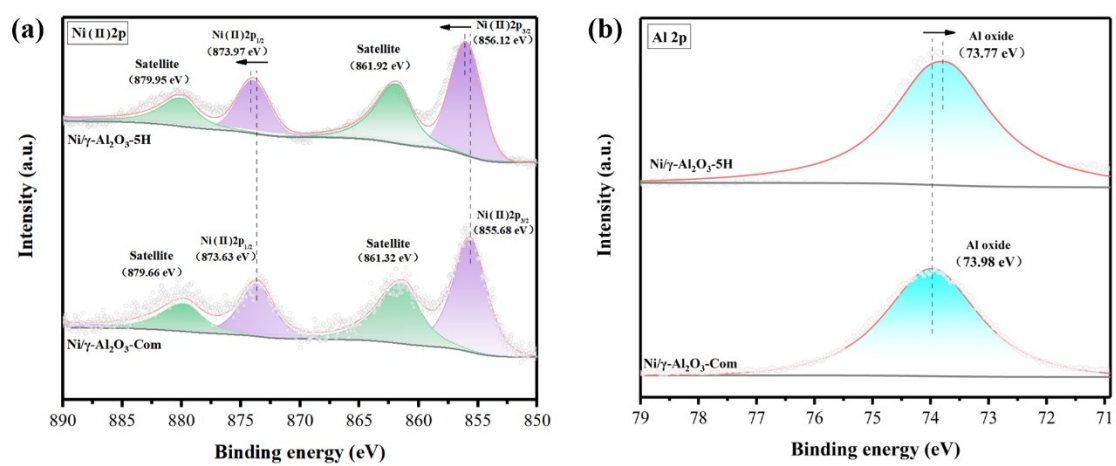


Fig. S8. XPS spectra (a) Ni 2p and (b) Al 2p of the spent Ni/γ-Al₂O₃-5H and spent Ni/γ-Al₂O₃-Com catalysts.