

Electronic Supplementary Material

Synergistic effect of Fe-Mn bimetallic sites with close proximity for enhanced CO₂ hydrogenation performance

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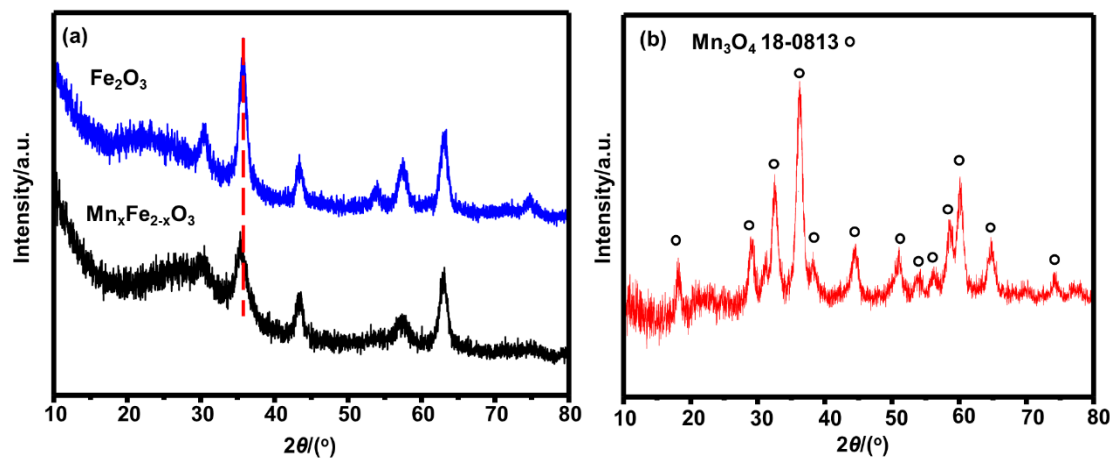


Fig. S1. XRD patterns of the as-prepared (a) Fe_2O_3 , $\text{Mn}_x\text{Fe}_{2-x}\text{O}_3$ nanoparticles and (b) Mn_3O_4 nanoparticles

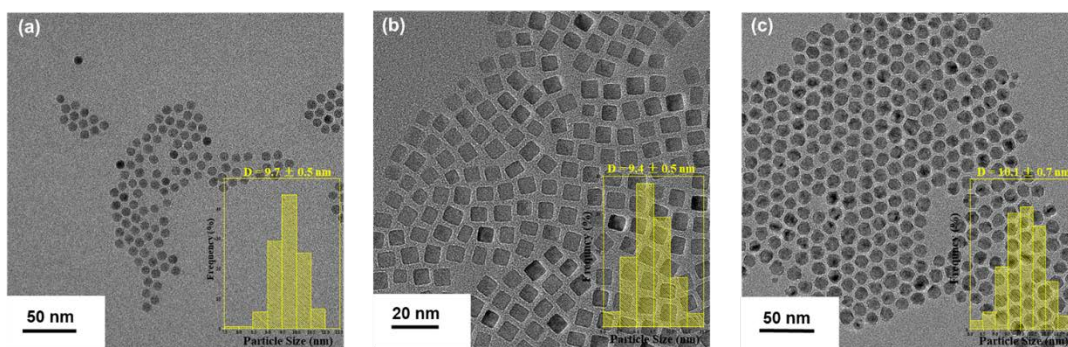


Fig. S2. TEM images of the as-prepared (a) Fe_2O_3 , (b) $\text{Mn}_x\text{Fe}_{2-x}\text{O}_3$ and (c) Mn_3O_4 nanoparticles (the diagrams are the metal oxide particle size distribution of the corresponding catalysts)

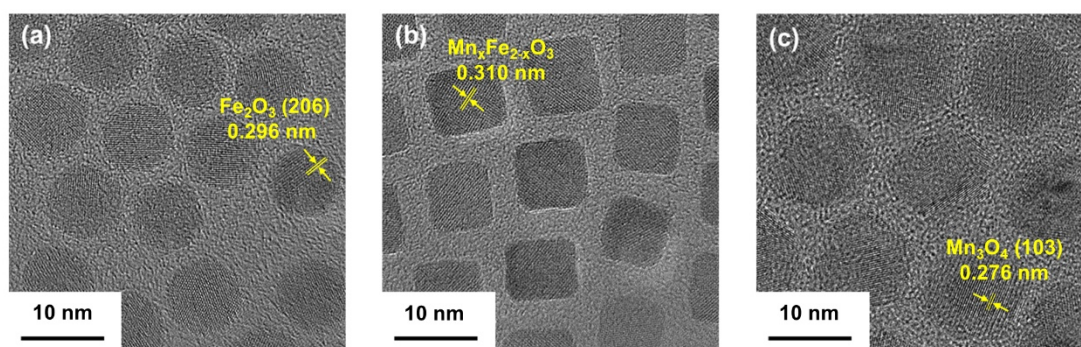


Fig. S3. HR-TEM images of the as-prepared (a) Fe_2O_3 , (b) $\text{Mn}_x\text{Fe}_{2-x}\text{O}_3$ and (c) Mn_3O_4 nanoparticles

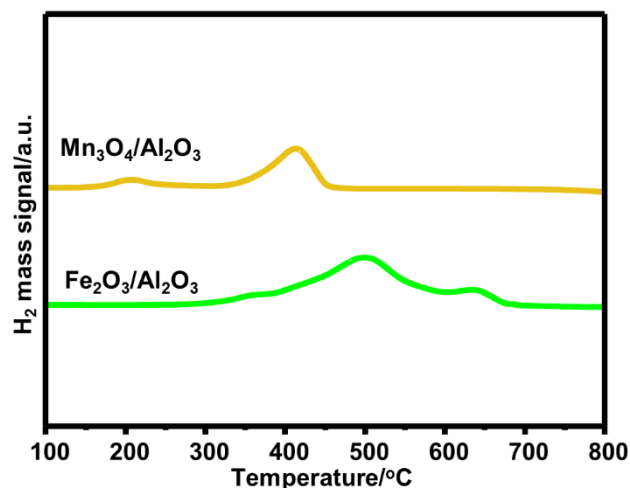


Fig. S4. H₂-TPR patterns of Fe₂O₃/Al₂O₃ and Mn₃O₄/Al₂O₃

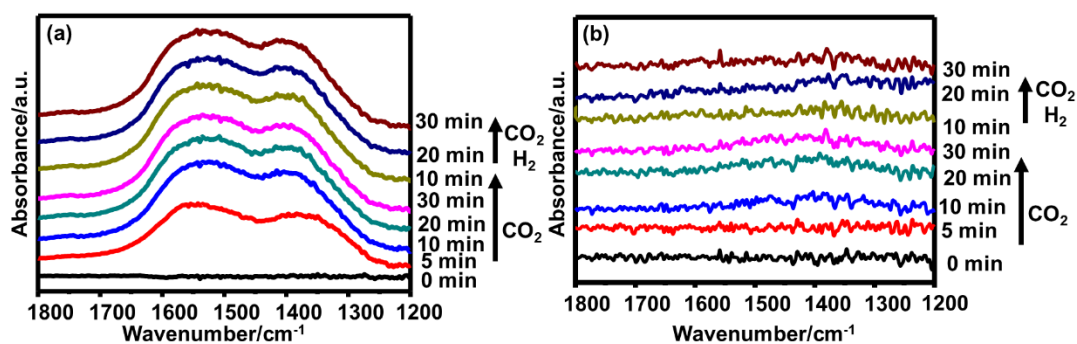


Fig. S5. DRIFT spectra of exposure to CO₂ and CO₂ hydrogenation on (a) Mn₃O₄/Al₂O₃ and (b) Fe₂O₃/Al₂O₃

Table S1. Textural parameters and elemental compositions of the as prepared catalysts

Catalyst	S _{BET} (m ² g ⁻¹) ^a	D _{mean} (nm) ^b	Fe (wt%)	Mn (wt%)
Fe ₂ O ₃ /Al ₂ O ₃	25.5	17.2	5.8	0
FeMn-stf	29.3	16.9	6.0	4.9
FeMn-imp	28.2	15.7	5.8	4.8
FeMn-mix	27.7	19.9	5.9	4.9

a. calculated according to BET method, b. mean micropore size based on BJH method.