Supporting Information

High-temperature Fischer–Tropsch synthesis of light olefins over nano-Fe_3O_4@MnO_2 core-shell catalysts

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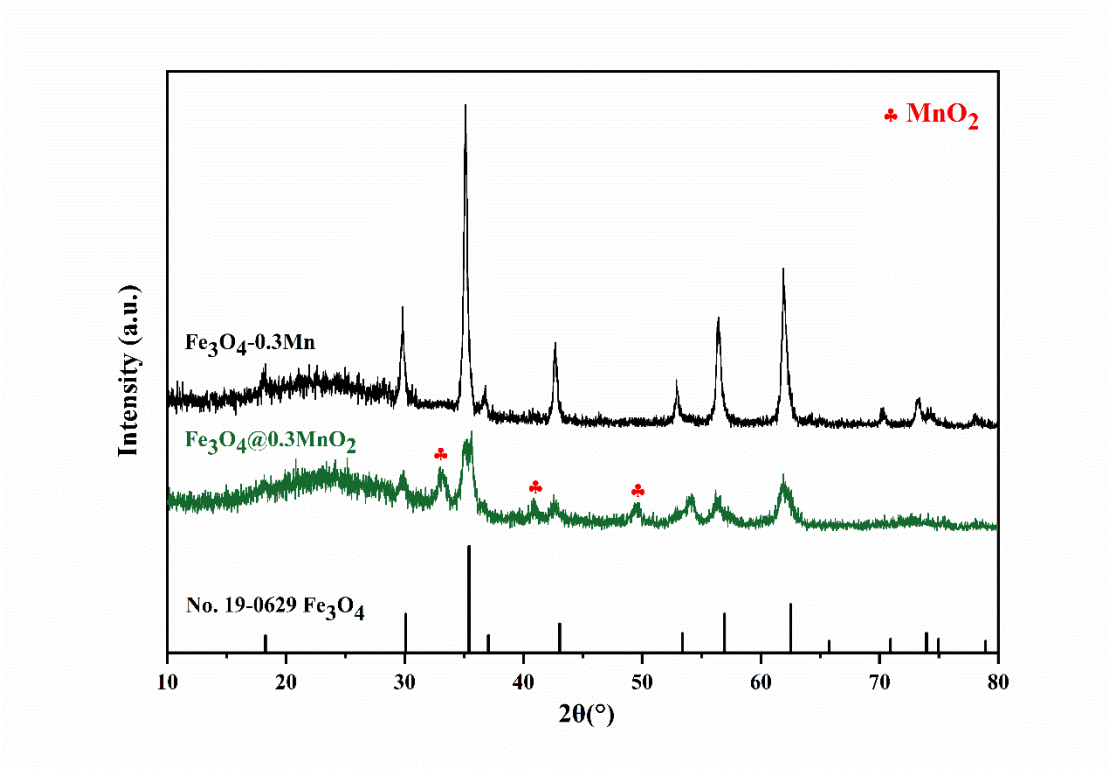


Figure S1. XRD patterns of Fe_3O_4-0.3Mn and Fe_3O_4@0.3MnO_2 after heat treatment.

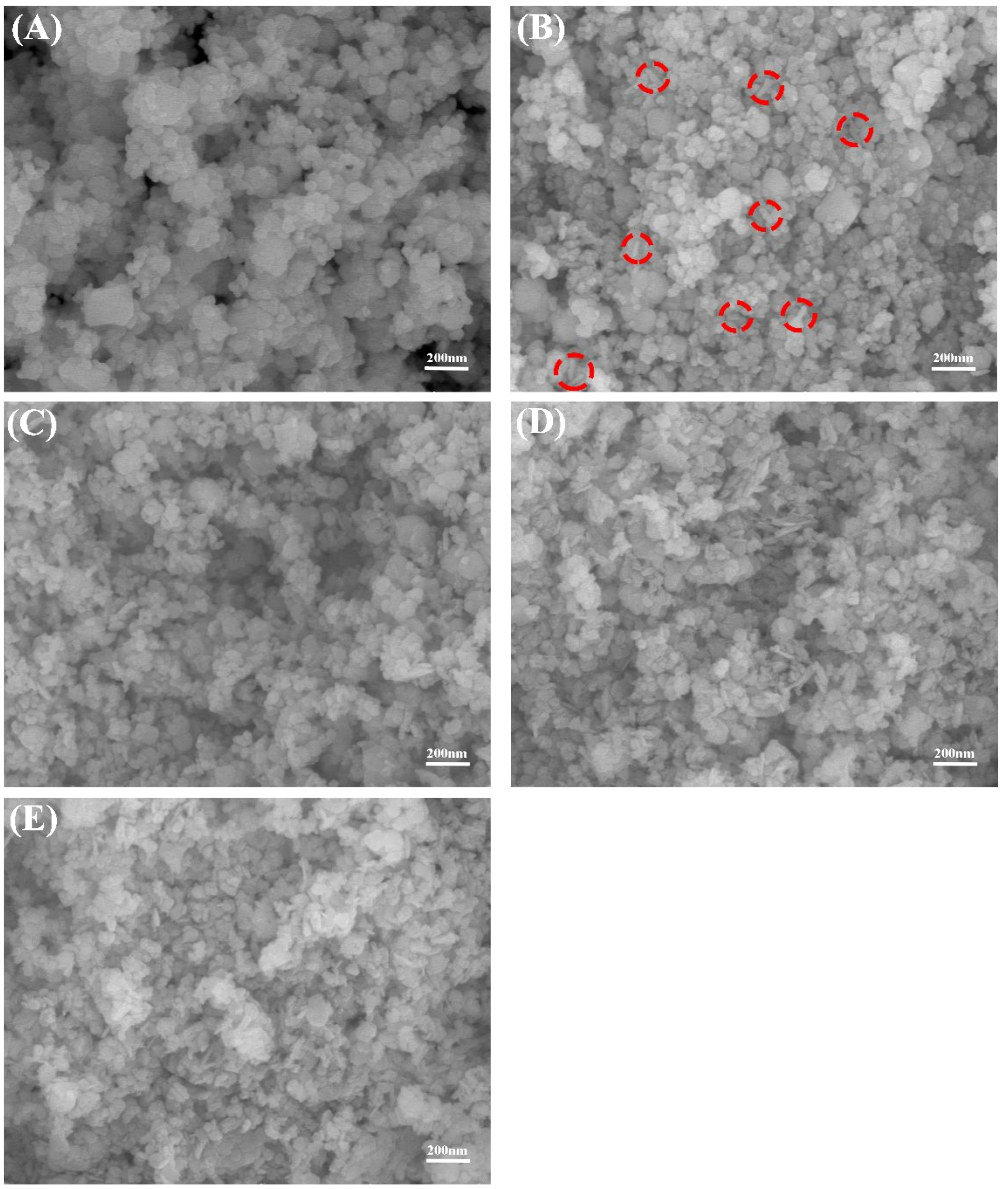


Figure S2. SEM images of as-synthesized samples (A) Fe_3O_4; (B) Fe_3O_4@0.1MnO_2; (C) Fe_3O_4@0.2MnO_2; (D) Fe_3O_4@0.3MnO_2; (E) Fe_3O_4@0.4MnO_2.

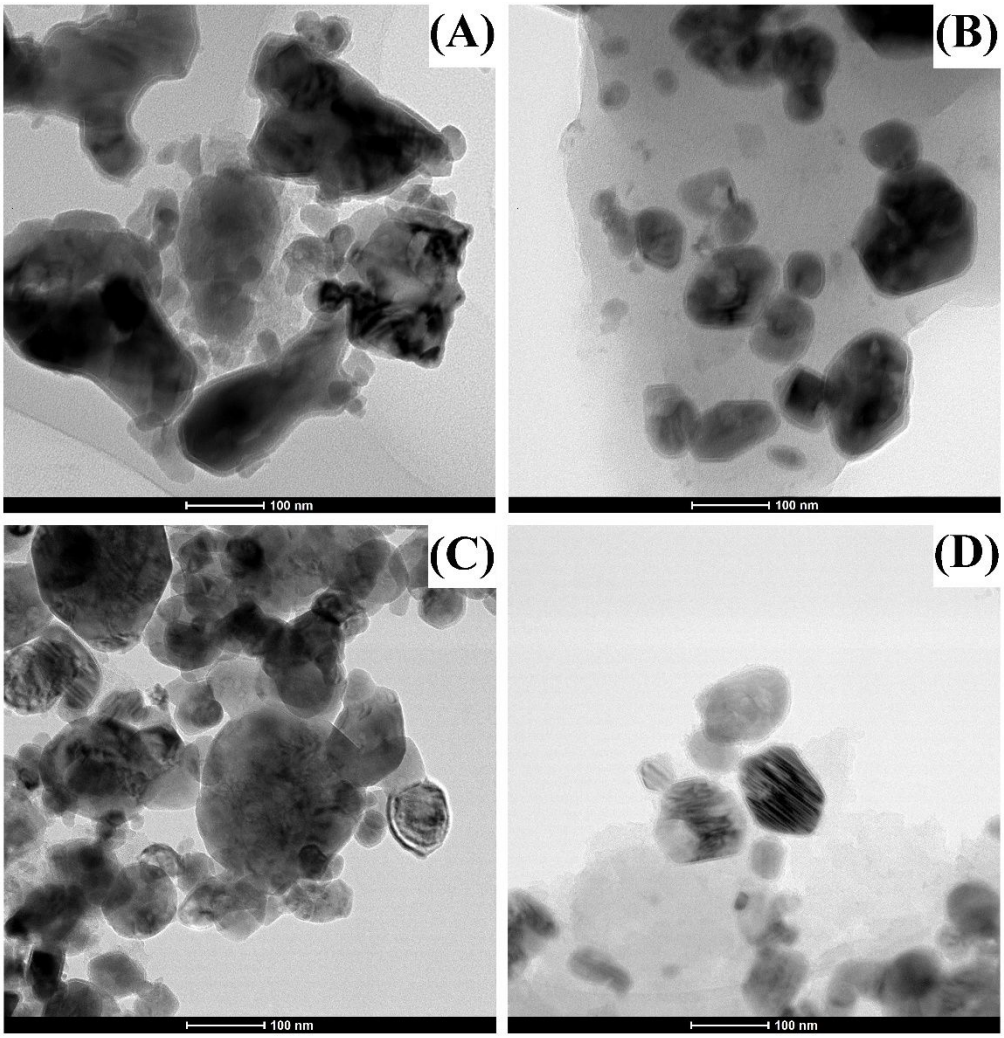


Figure S3. HRTEM images of spent catalysts (A) Fe_3O_4 after 48 h reaction; (B) Fe_3O_4@0.3MnO_2 after 48 h reaction; (C) Fe_3O_4-0.3Mn after 48 h reaction; (D) Fe_3O_4@0.3MnO_2 after 288 h reaction.

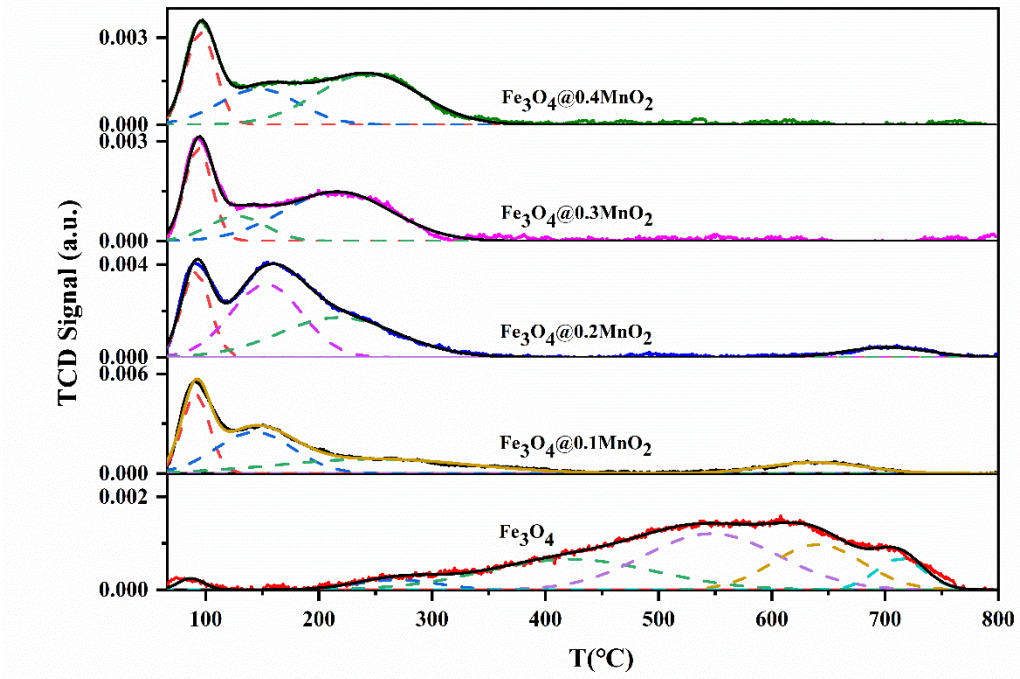


Figure S4. Fitting results of H_2-TPD.

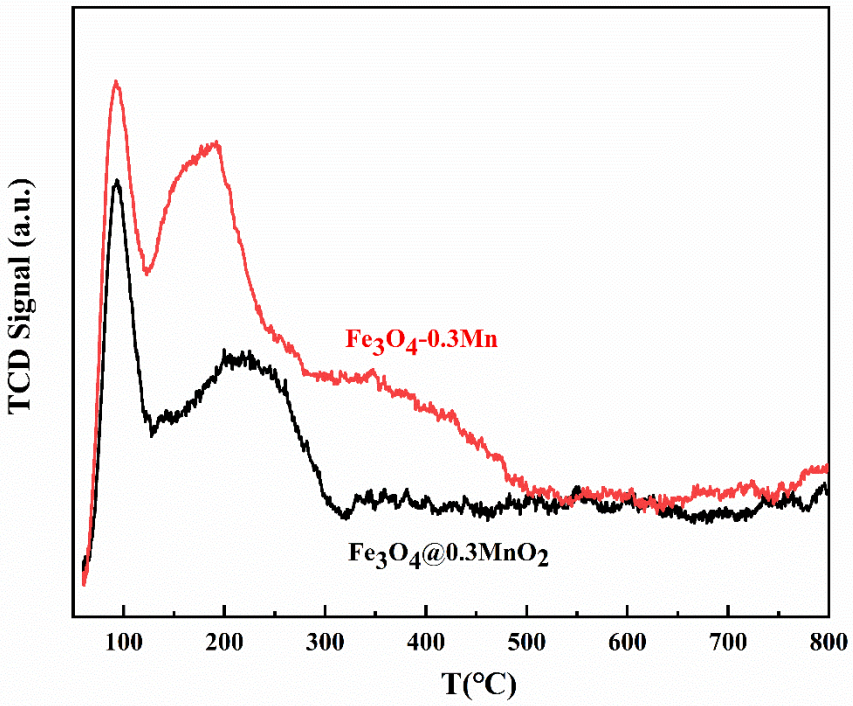


Figure S5. H_2-TPD profiles of H_2-reduced Fe_3O_4-0.3Mn and Fe_3O_4@0.3MnO_2 catalysts.

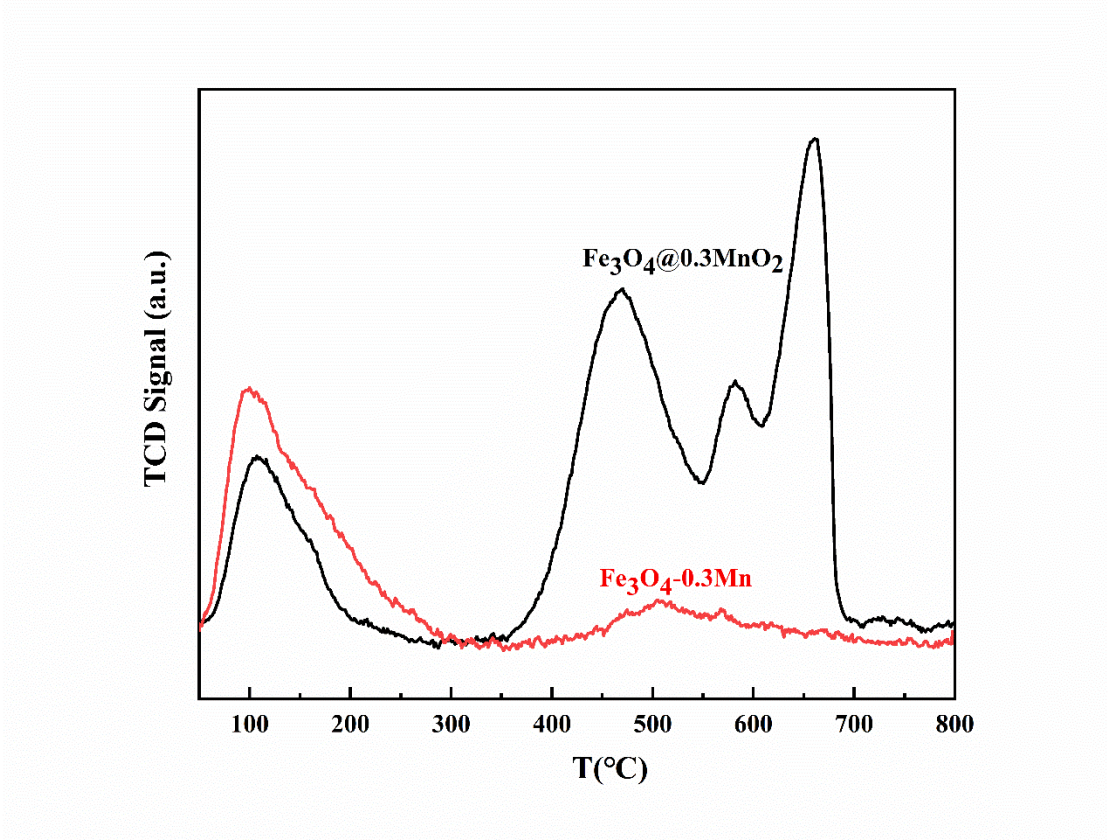


Figure S6. CO-TPD profiles of H_2-reduced Fe_3O_4-0.3Mn and Fe_3O_4@0.3MnO_2 catalysts.

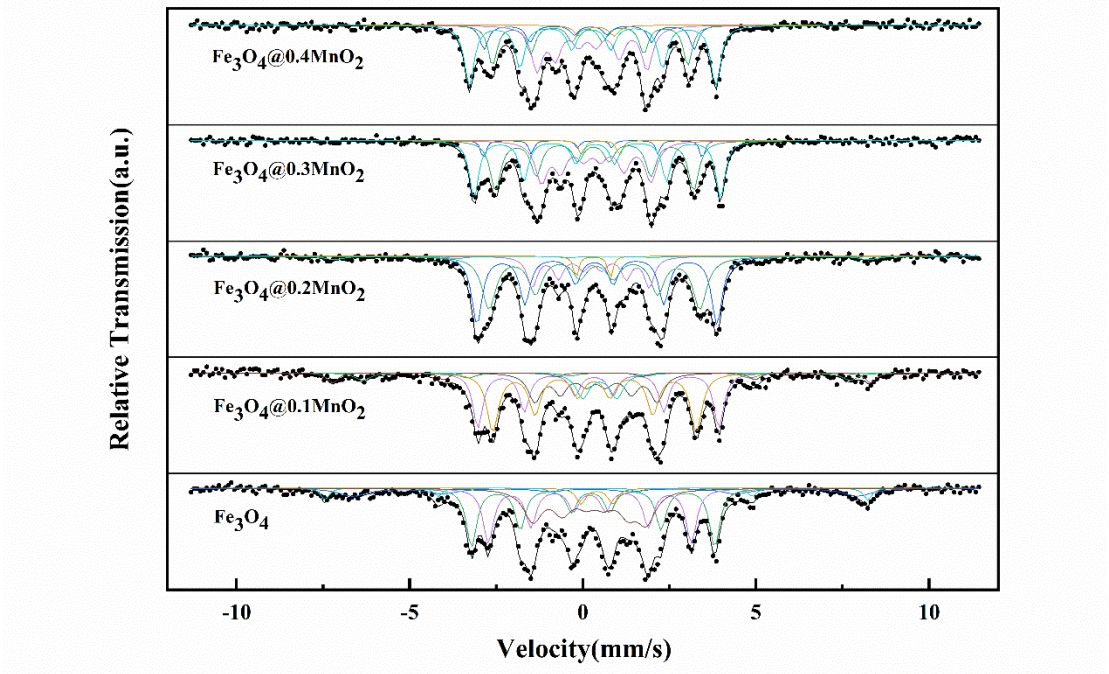


Figure S7. Mössbauer spectrum of the samples after reaction. Reaction condition: 340 °C, H_2/CO=2, 1.5 MPa, 11000 mL/(h·g_{Cat}), 48 h.

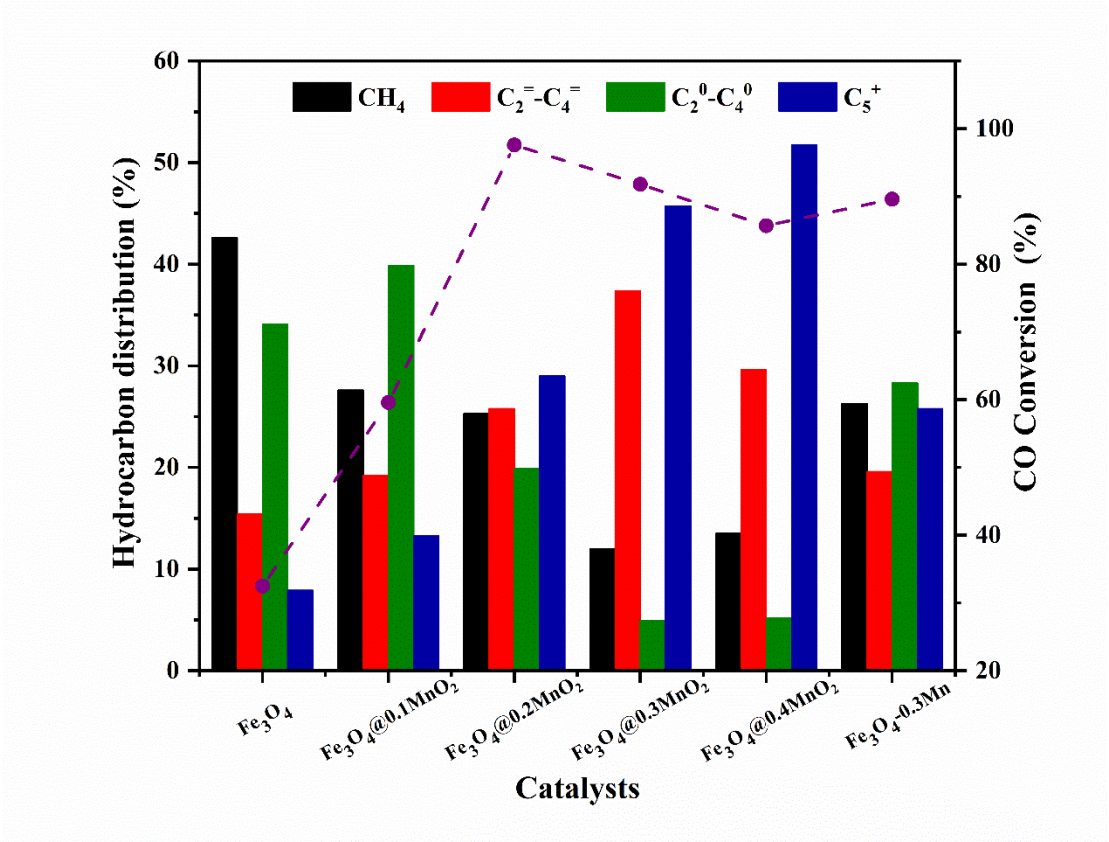


Figure S8. Hydrocarbon distribution and CO conversion based on the product distribution after 48 h on stream. (the bars are stacked)

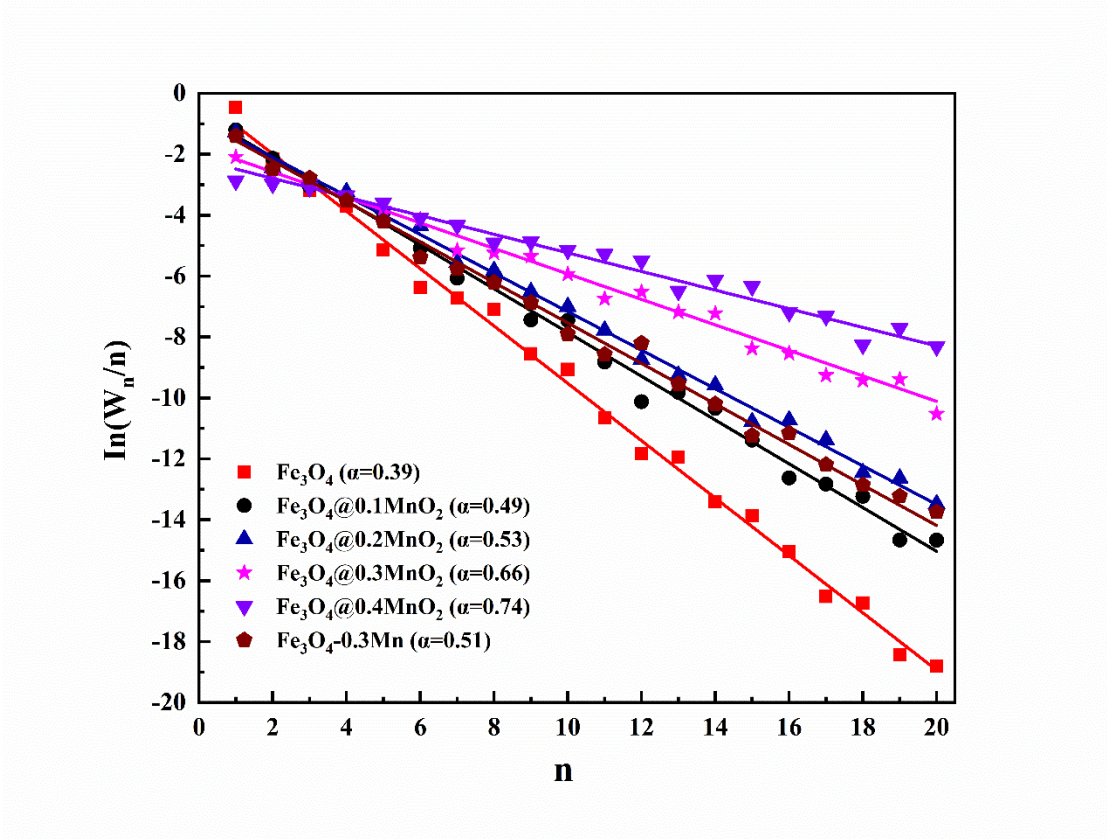
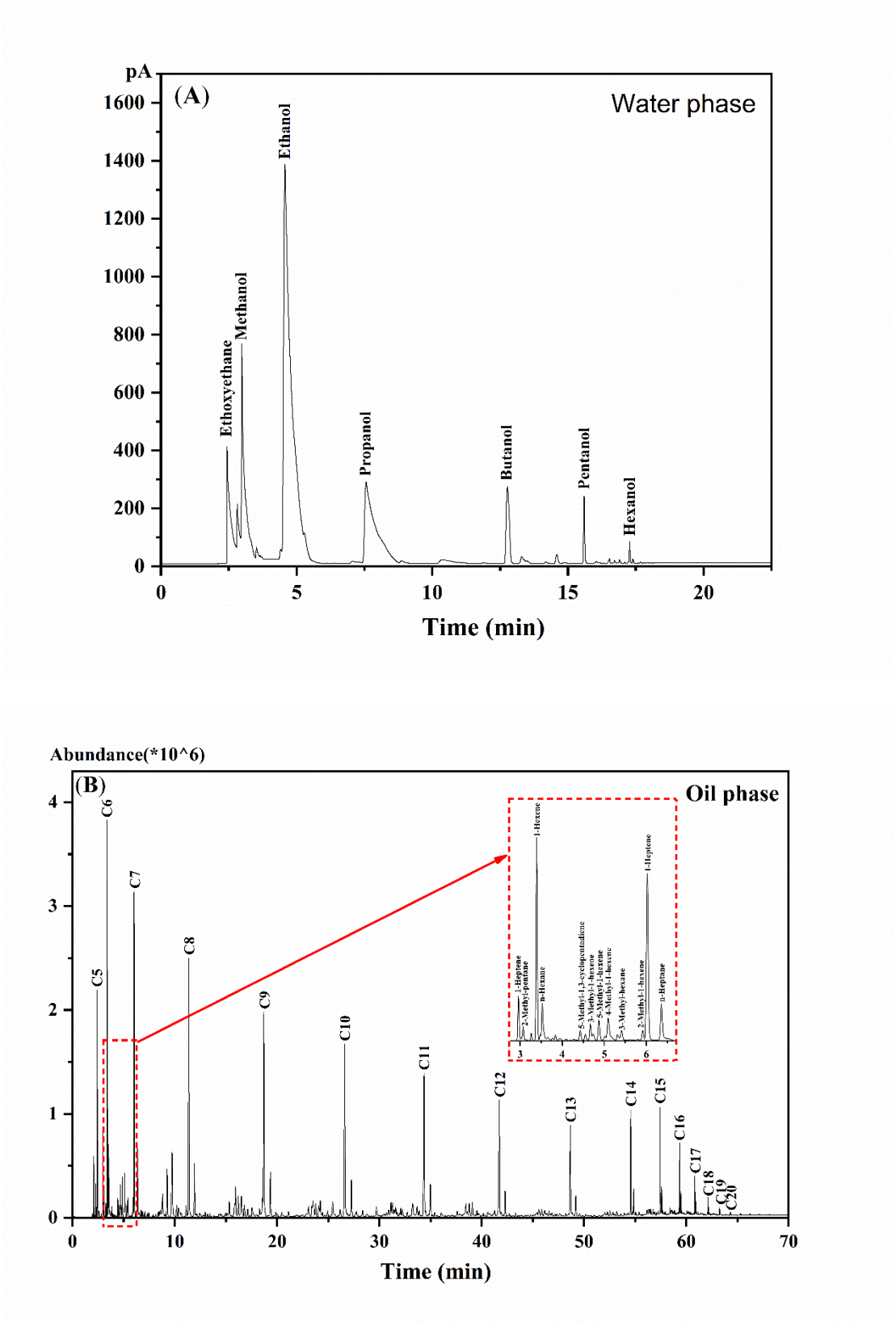


Figure S9. ASF plot of the catalysts based on the product distribution after 48 h on stream.



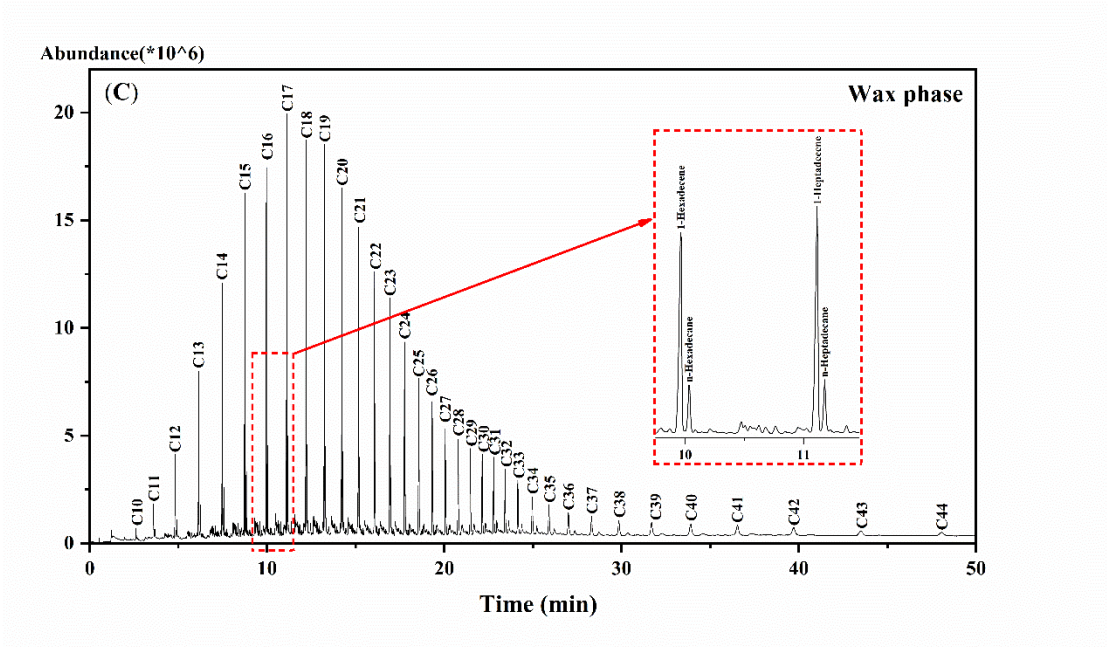


Figure S10. Typical GC-MS result of the liquid products: (A) Water phase; (B) Oil phase; (C) Wax phase.