Supplementary material

Supported Fe/MnO_x catalyst with Ag doping for remarkably enhanced catalytic activity in Fischer-Tropsch synthesis

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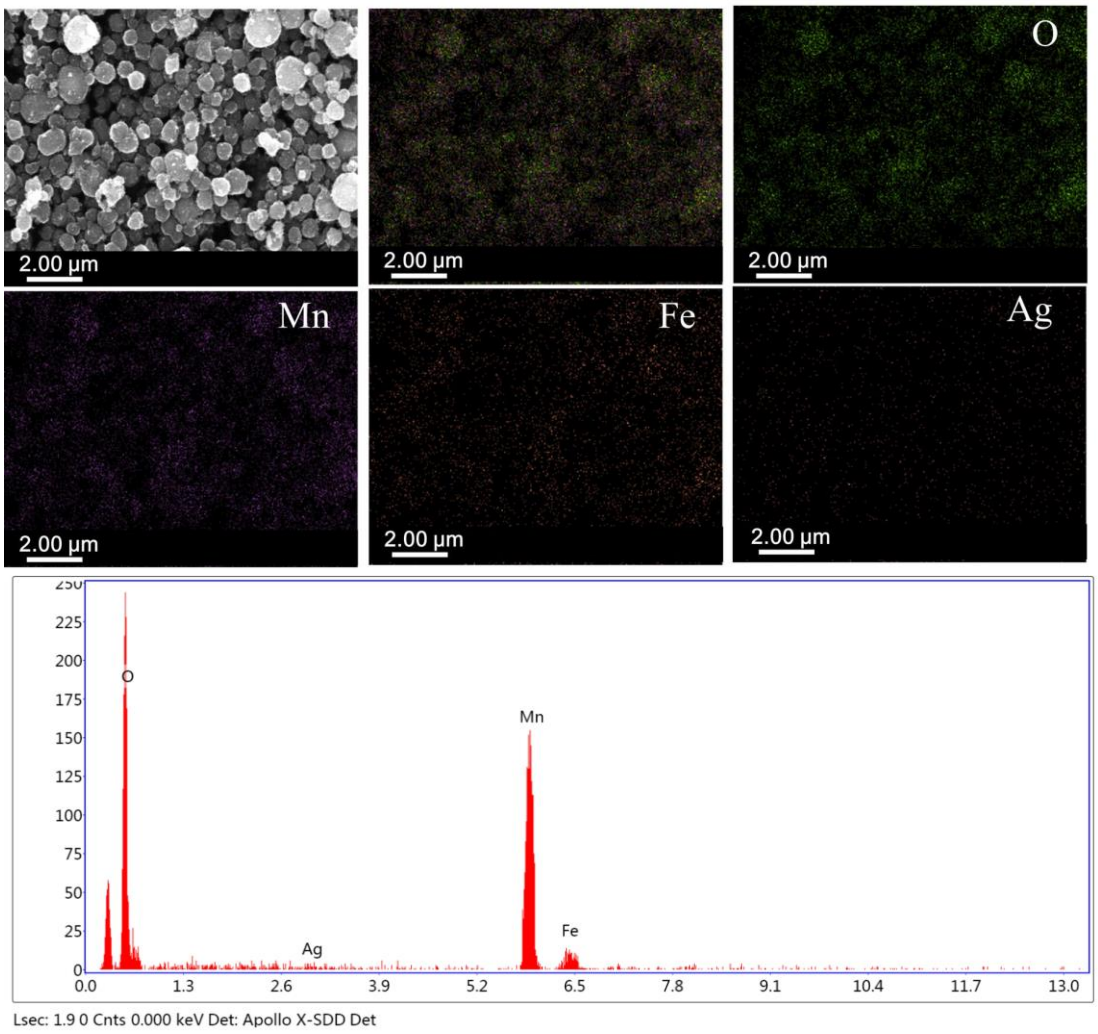

Fig. S1 SEM image, EDS mapping of Fe, Mn, Ag and O, respectively, and EDS spectra of the fresh 1Ag10Fe/MnO_x catalyst sample.

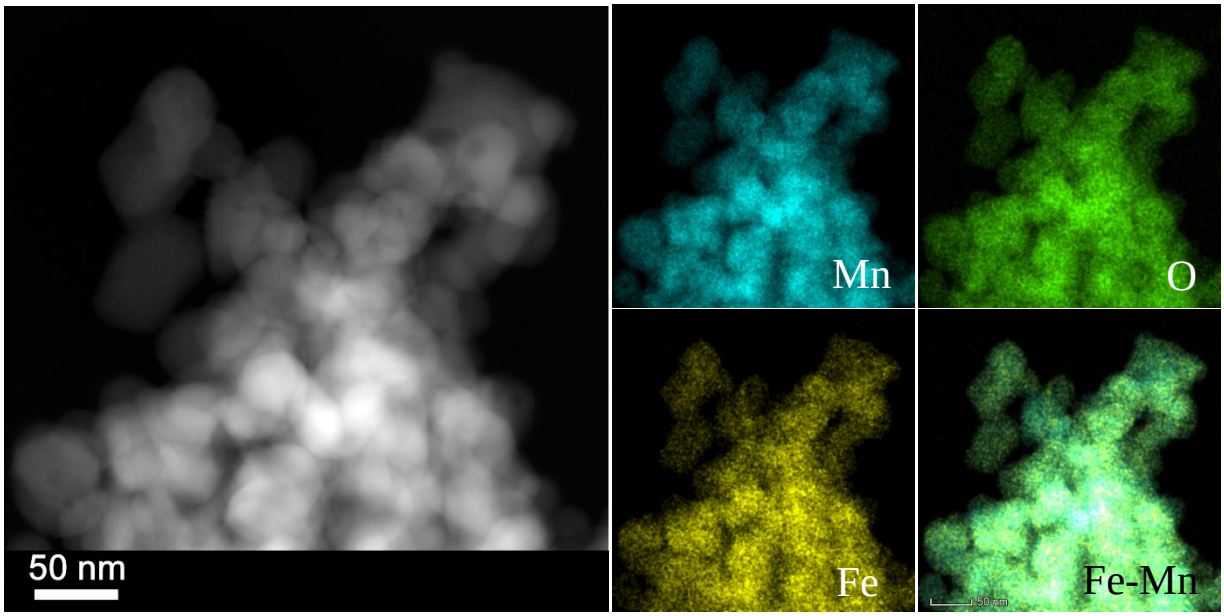

Fig. S2 A HAADF-STEM image and the corresponding elemental mapping of a reduced 10wt%Fe/MnO_x catalyst sample at 673 K.

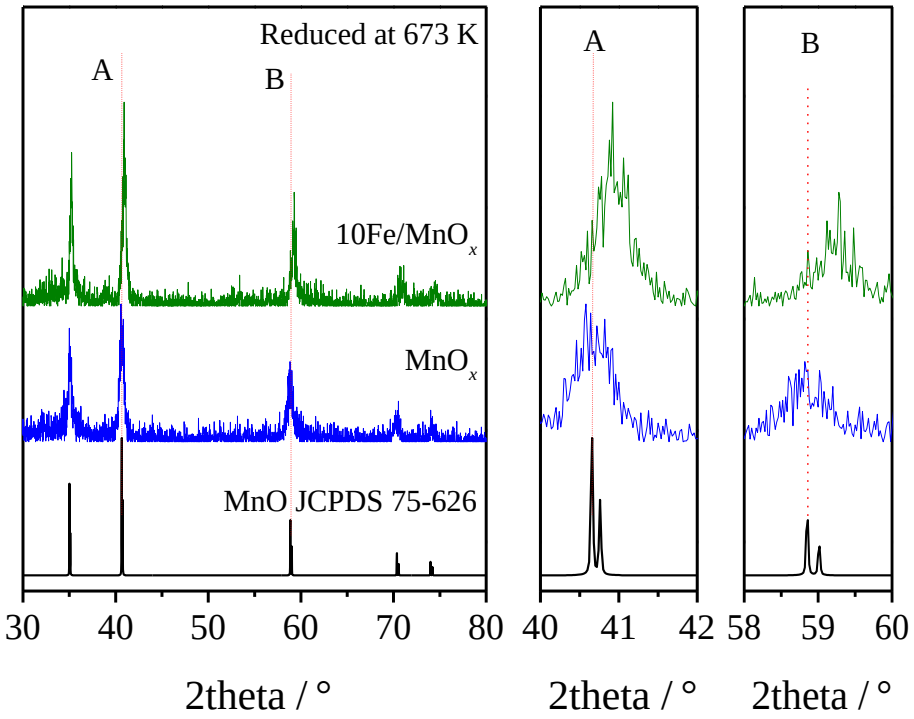

Fig. S3 Comparison of XRD patterns of MnO_x support and 10Fe/MnO_x catalyst sample reduced at the same 673 K by H_2.

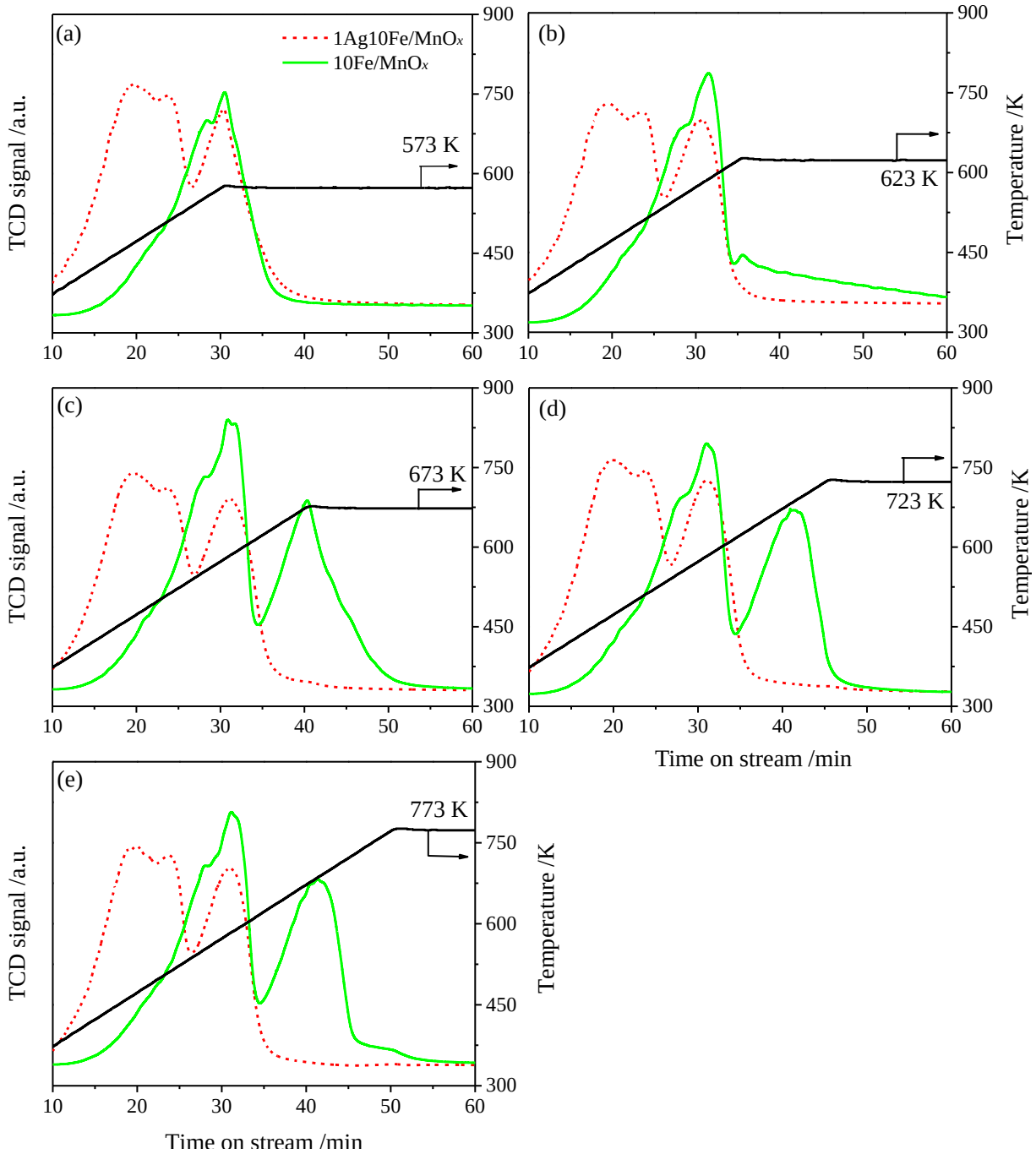

Fig. S4 H_2-TPR profiles of 10Fe/MnO_x and 1Ag10Fe/MnO_x catalysts under different temperature programing profiles.

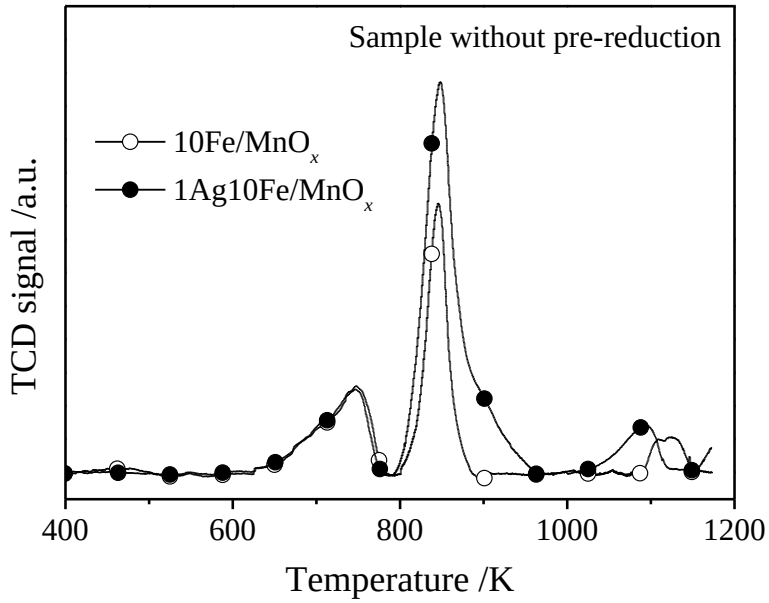

Fig. S5 H_2-TPD profiles of fresh 10Fe/MnO_x and 10Fe1Ag/MnO_x samples without H_2 reduction.

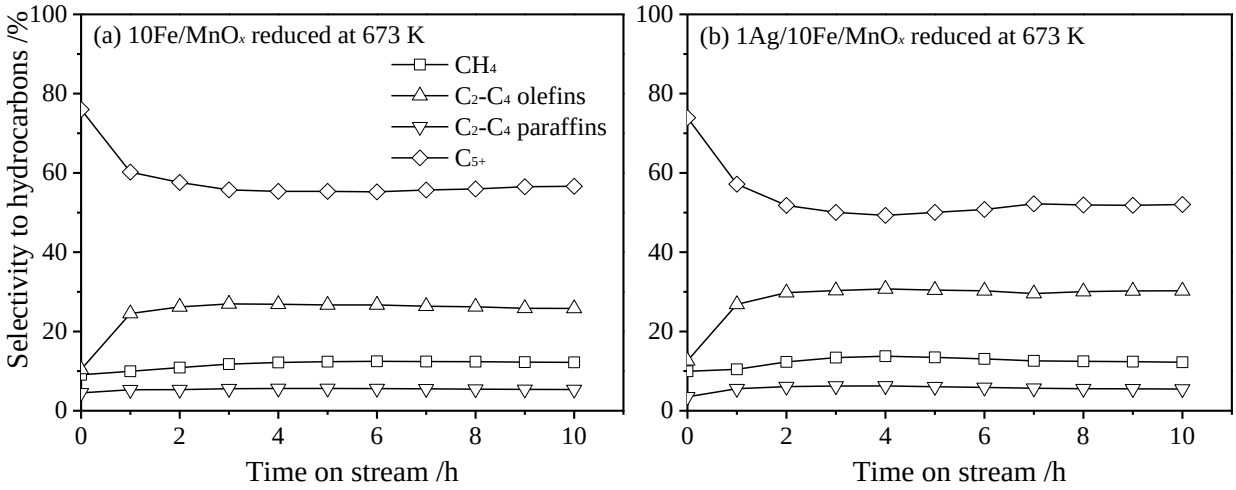

Fig. S6 Time-dependence of selectivity to hydrocarbons obtained over 10Fe/MnO_x and 1Ag/10Fe/MnO_x catalysts reduced at 673 K.

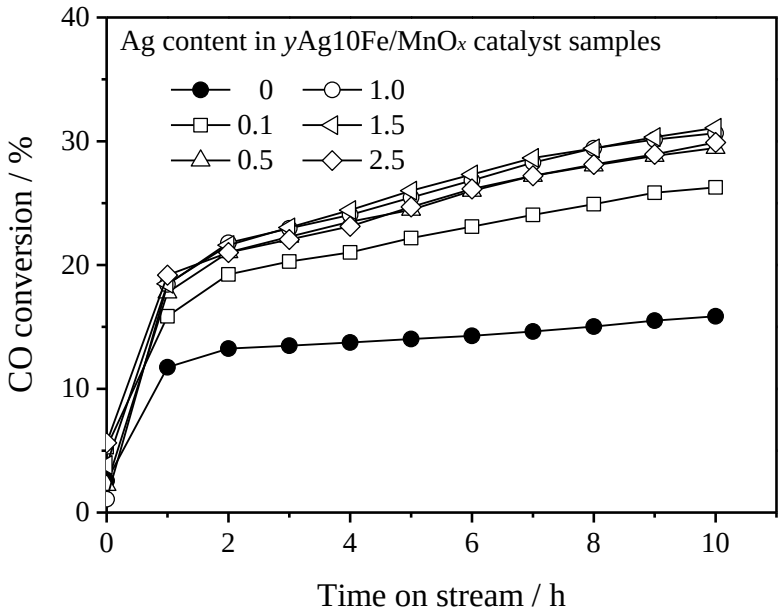

Fig. S7 Effect of Ag content in 10Fe/MnO_x catalyst on time-dependence of CO conversion obtained over the catalysts at 573 K, 1.0 MPa and 7400 mL g^{-1} h^{-1} (H_2/CO = 1.1). All catalysts were reduced in a H_2 stream at 673 K and 0.2 MPa for 3 h prior to reaction.

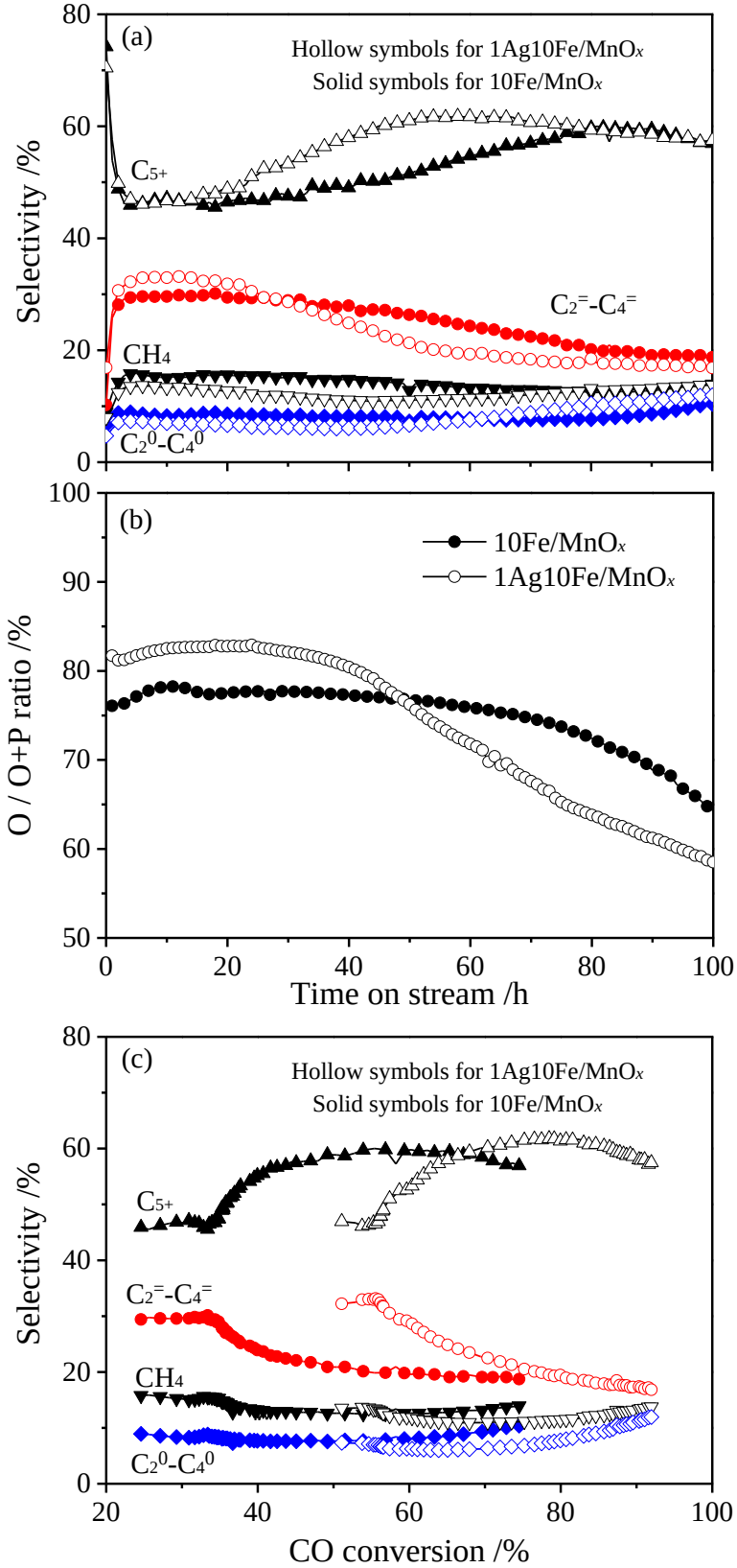

Fig. S8 Time-dependence of the CO_2-free selectivities to hydrocarbons and O/O+P ratio obtained over 10Fe/MnO_x and 1Ag10Fe/MnO_x catalysts during a 100-hour test at 593 K, 1 MPa and 7400 mL g^{-1} h^{-1} (a, b) and the relationship between CO conversion and selectivity (c).

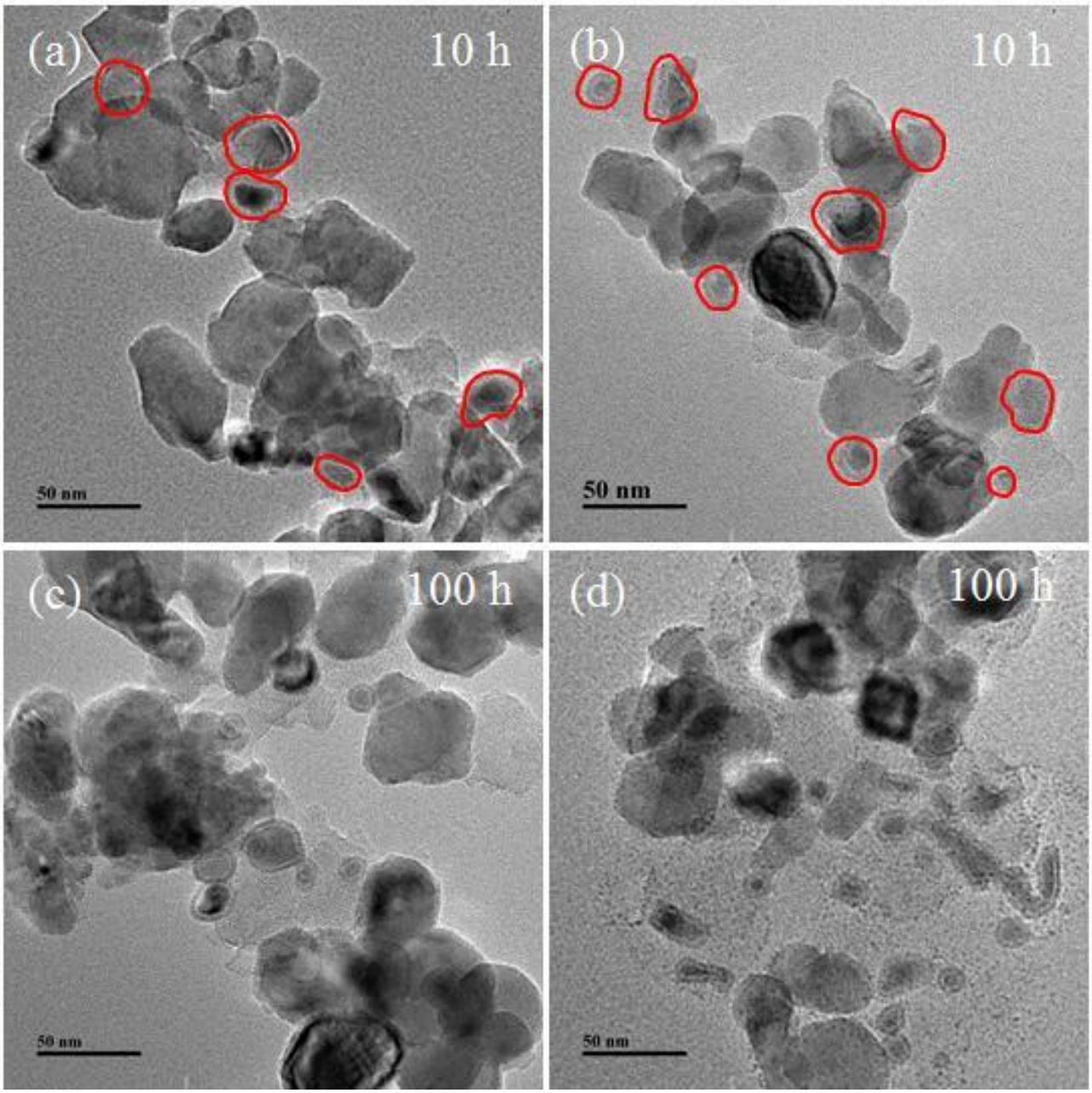

Fig. S9 TEM images of spent catalyst samples (reduced at 673 K): 10Fe/MnO_x (a and c); 1Ag10Fe/MnO_x (b and d).