How do the Unique Au/α-Fe_2O_3 Interfacial Structures Determine Activity in CO Oxidation

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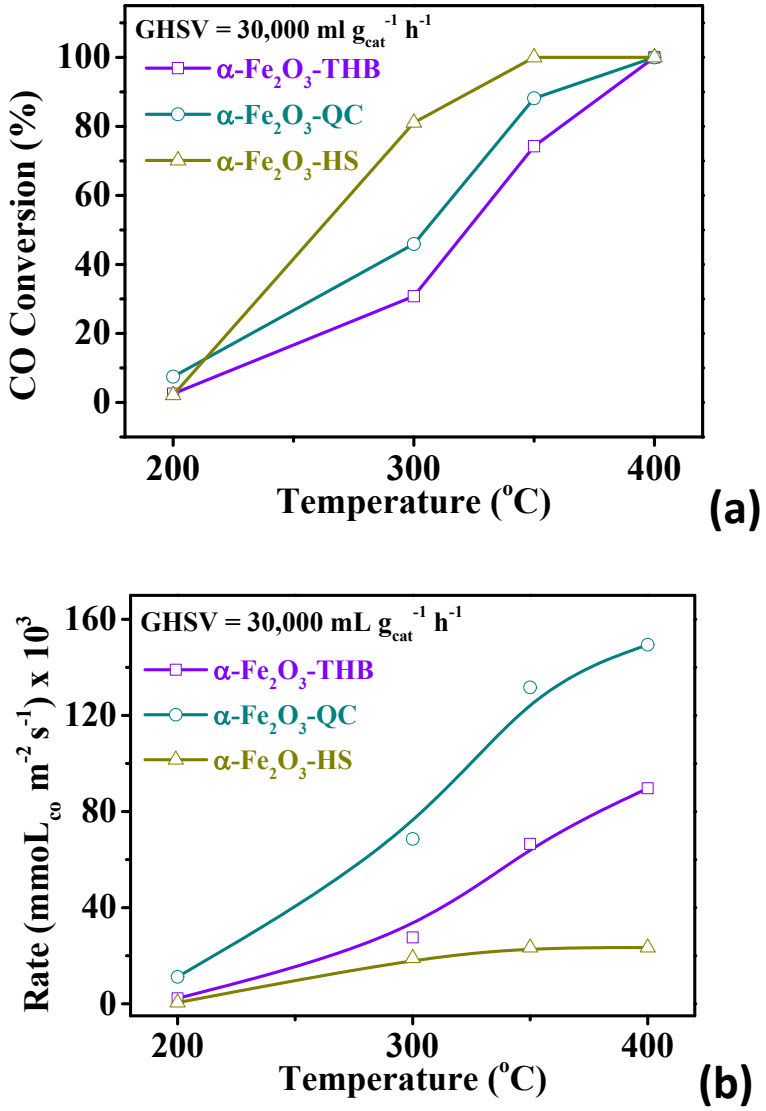

Fig. S1 CO conversion (a) and CO conversion rates (b) on α-Fe_2O_3-THB, α-Fe_2O_3-QC, α-Fe_2O_3-HS with a GHSV = 30,000 mL g_{cat}^{-1} h^{-1}

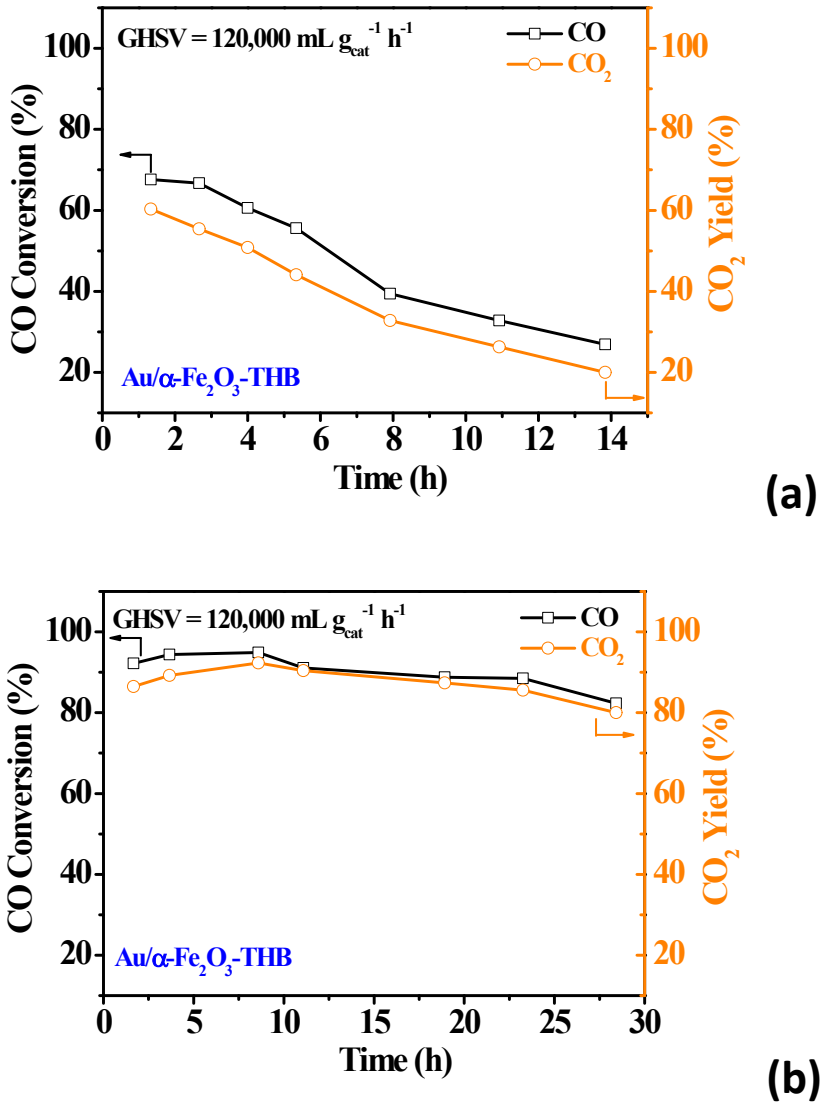

Fig. S2 Durability test of Au/α-Fe_2O_3-THB at CO conversion of (a) ca. 70% and (b) 90% (GHSV = 120,000 mL g_{cat}^{-1} h^{-1}).

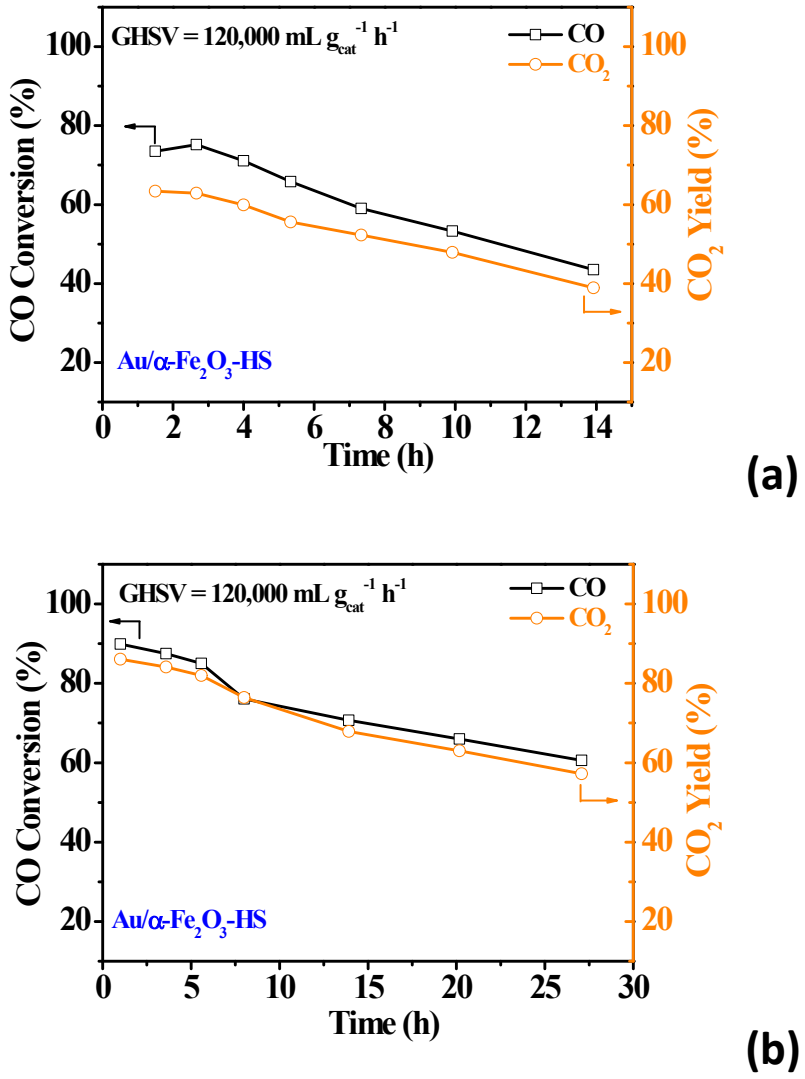

Fig. S3 Durability test of Au/α-Fe_2O_3-HS at CO conversion of (a) ca. 70% and (b) 90% (GHSV = 120,000 mL g_{cat}^{-1} h^{-1}).

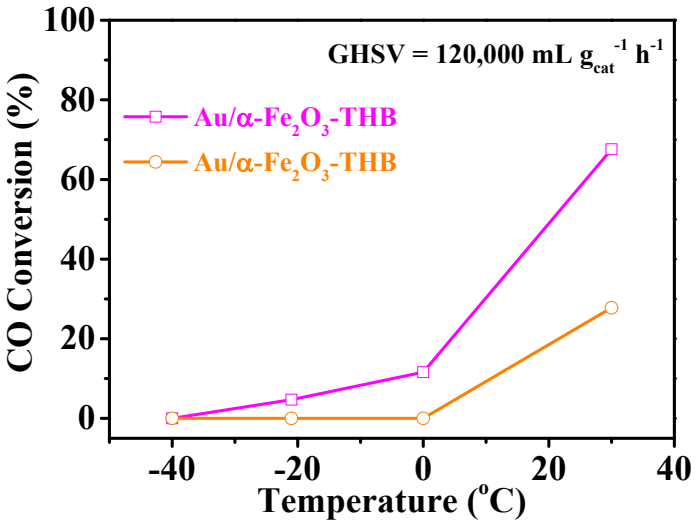

Fig. S4 Temperature-dependence of CO conversion in the -40~30°C range over Au/α-Fe_2O_3-THB and Au/α-Fe_2O_3-HS (GHSV = 120,000 mL g_{cat}^{-1} h^{-1}).

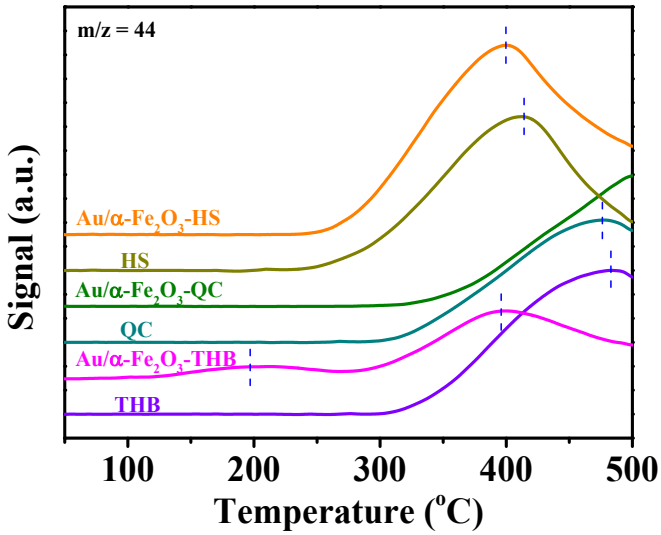

Fig. S5 CO_2 signals during CO-TPSR for the α-Fe_2O_3 substrates (α-Fe_2O_3-THB, α-Fe_2O_3-QC, and α-Fe_2O_3-HS) and the Au-loaded samples (Au/α-Fe_2O_3, Au/α-Fe_2O_3-QC, and Au/α-Fe_2O_3-HS).

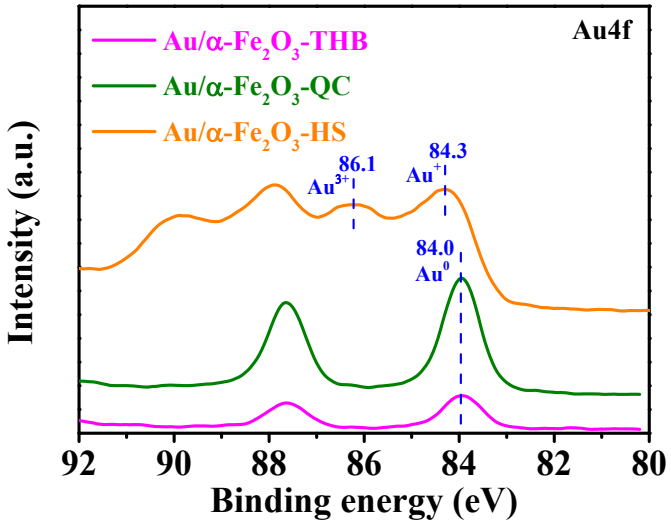

Fig. S6 Au4f XPS profiles of the Au-loaded samples (Au/α-Fe_2O_3, Au/α-Fe_2O_3-QC, and Au/α-Fe_2O_3-HS).

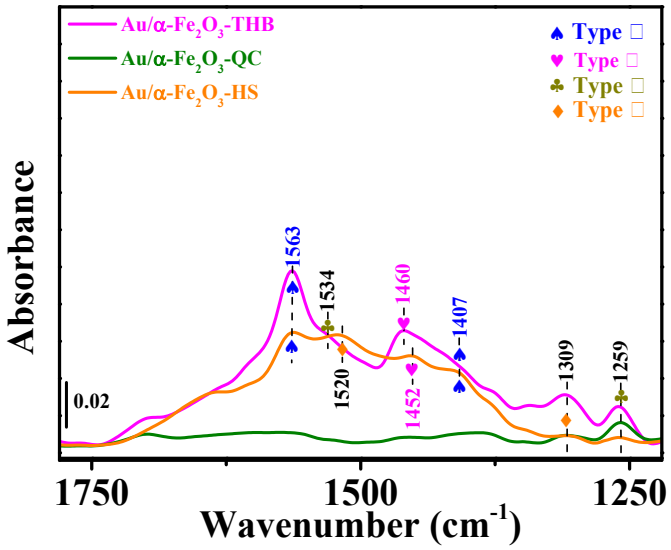

Fig. S7 FTIR spectra collected on the Au-loaded samples (Au/α-Fe_2O_3-THB, Au/α-Fe_2O_3-QC, and Au/α-Fe_2O_3-HS) at RT. Type I (♠): formate; type II (♥): non-coordinated carbonate; type III (♣): bi-dentate carbonate; type IV (♦): mono-dentate carbonate.

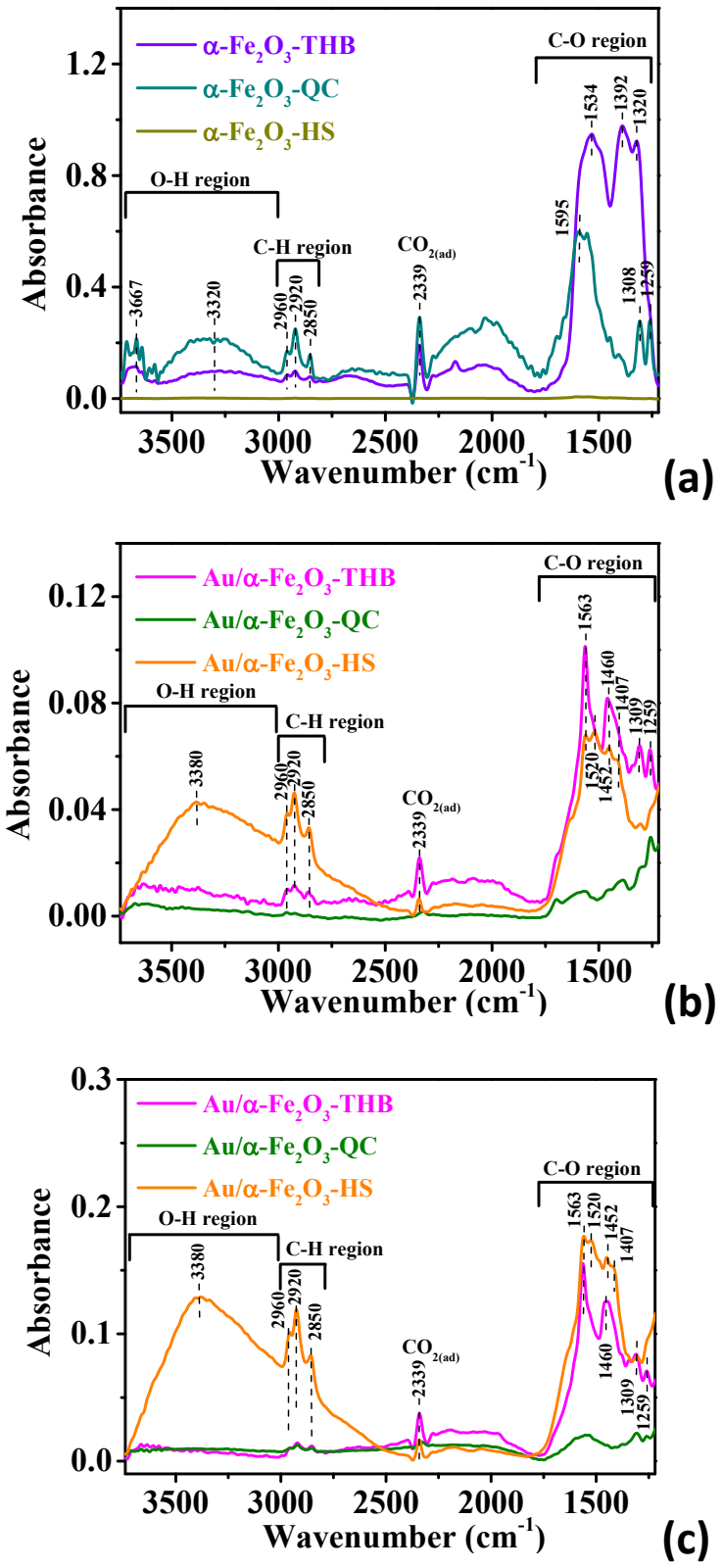

Fig. S8 FTIR spectra collected (a) on α-Fe_2O_3-THB, α-Fe_2O_3-QC, and α-Fe_2O_3-HS at 200 °C, (b) on Au/α-Fe_2O_3-THB, Au/α-Fe_2O_3-QC, and Au/α-Fe_2O_3-HS at RT, and (c) on Au/α-Fe_2O_3-THB, Au/α-Fe_2O_3-QC, and Au/α-Fe_2O_3-HS at 60 °C.