

Figure S1

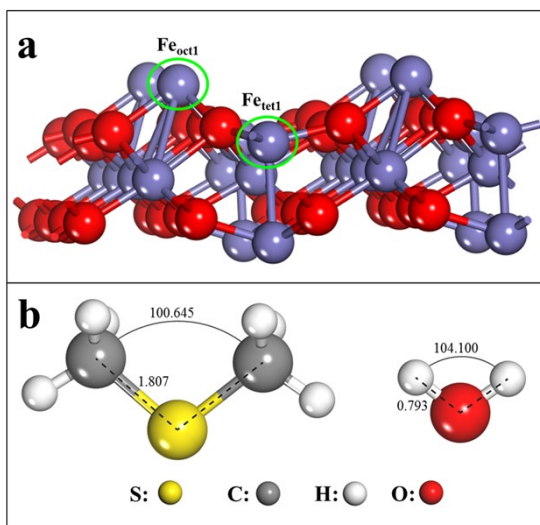


Figure S1 Structure of optimized Fe_3O_4 unit cell, dimethyl sulfide and water molecule models

Figure S2

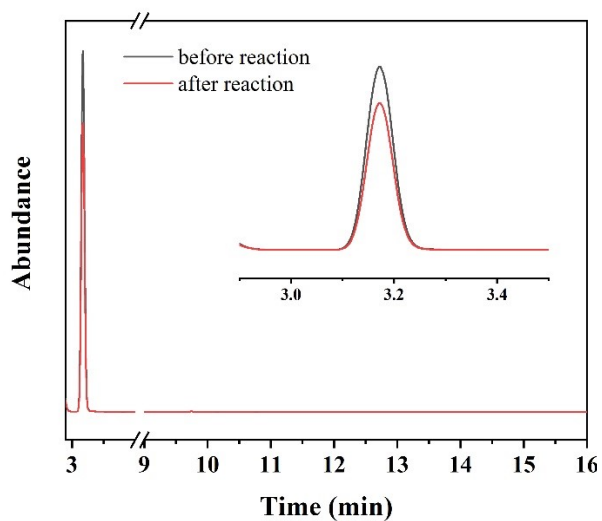


Figure S2 GC-MS spectra of reaction system before and after catalytic reaction; inset shows the amplification of $\text{C}_2\text{H}_6\text{SC}_2\text{H}_6$ species.

Figure S3

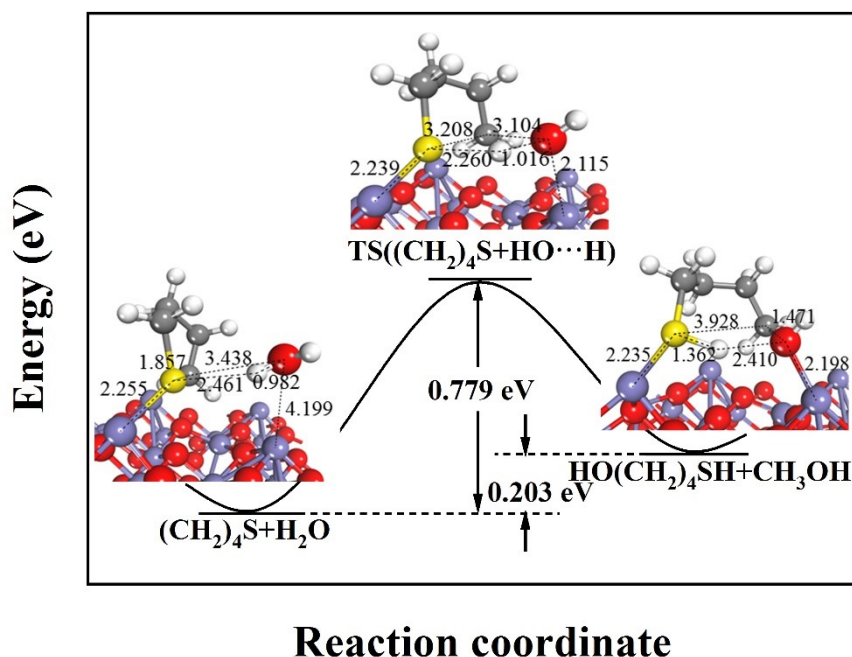


Figure S3 The structure and energy variety of optimized Fe_3O_4 (111) and $\text{C}_4\text{H}_8\text{S}$ during catalytic reaction with assistance of free H_2O molecule

Figure S4

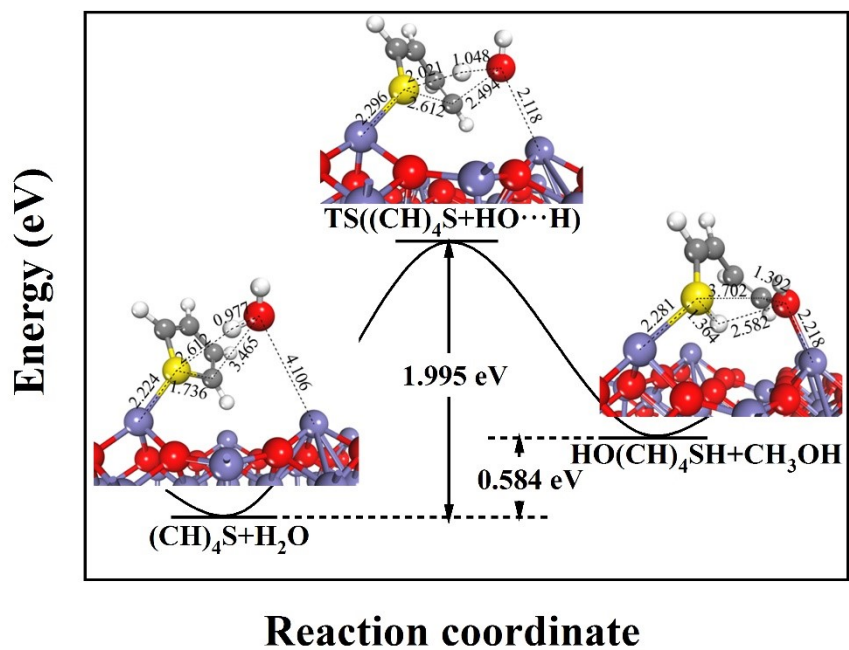


Figure S4 The structure and energy variety of optimized Fe_3O_4 (111) and $\text{C}_4\text{H}_4\text{S}$ during catalytic reaction with assistance of free H_2O molecule

Figure S5

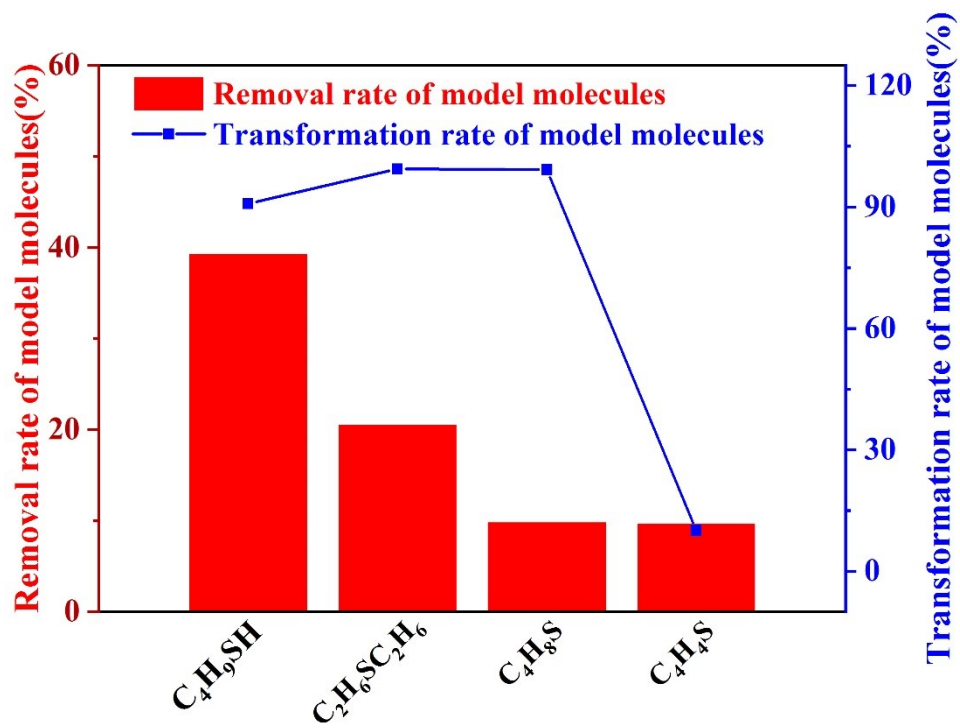


Figure S5 Removal rate and transformation rate of C_4H_9SH , $C_2H_6SC_2H_6$, C_4H_8S , C_4H_4S under equal reaction condition (30% H_2O , 200°C/12 h)