Electronic Supplementary Material (ESI) for Catalysis Science & Technology.
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Electronic supplementary information

Effect of Ni doping in $Ni_xMn_{1-x}Ti_{10}$ (x = 0.1-0.5) on activity and SO_2 resistance for NH_3-SCR of NO studied with in situ DRIFTS

Table S1. The quantitative results of mass fraction of various catalysts by ICP

samples	Mass fraction of elemental (wt %)		
	Ni	Mn	Ti
$MnTi_{10}$	-	6.15	54.11
$Ni_{0.1}Mn_{0.9}Ti_{10}$	0.68	5.61	54.17
$Ni_{0.2}Mn_{0.8}Ti_{10}$	1.30	5.02	54.20
$Ni_{0.3}Mn_{0.7}Ti_{10}$	2.01	4.40	54.31
$Ni_{0.4}Mn_{0.6}Ti_{10}$	2.71	3.78	54.41
$Ni_{0.5}Mn_{0.5}Ti_{10}$	3.40	3.05	54.50

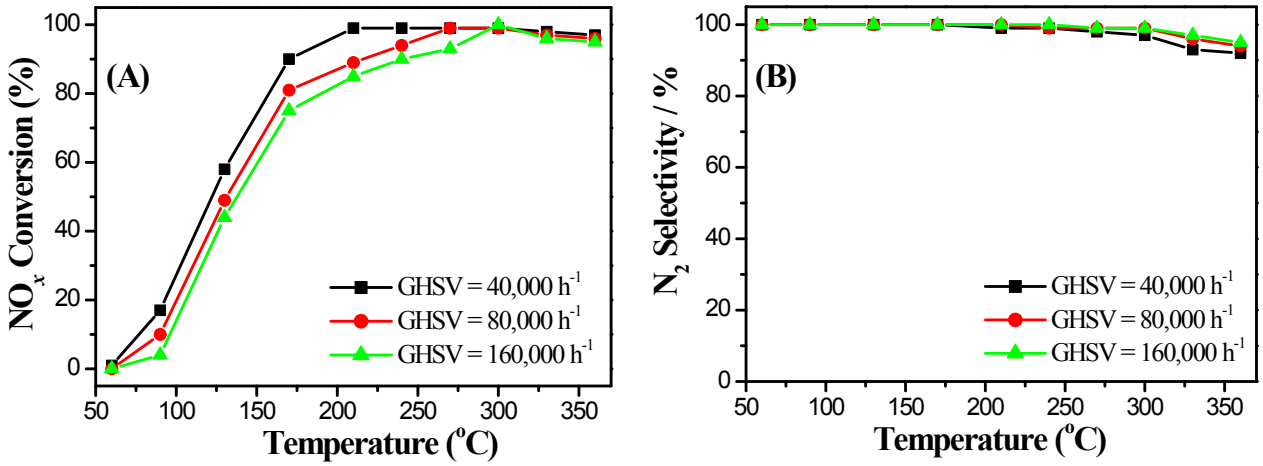

Fig. S1 NH_3-SCR performance of $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalysts under different gas hourly space velocities (A) NO_x conversion and (B) N_2 selectivity. Reaction conditions: [NO] = [NH_3] = 1000 ppm, [O_2] = 3 vol. % and N_2 as balance gas.

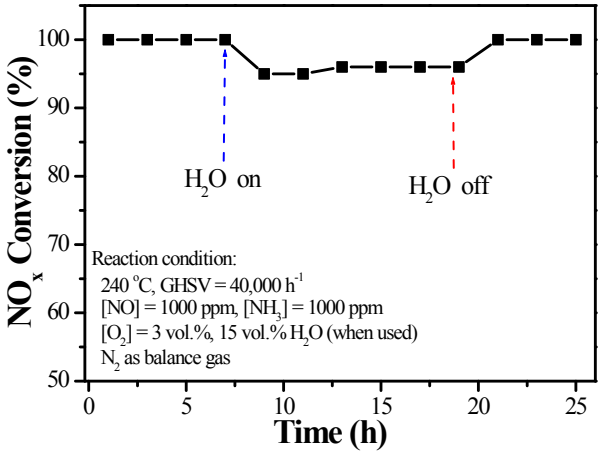

Fig. S2 Effect of H_2O on NO_x conversion over $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalyst

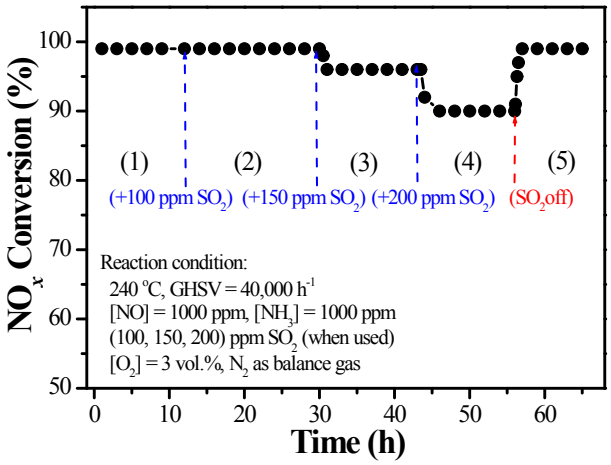

Fig. S3 Effect of SO_2 on NO_x conversion over the $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalyst

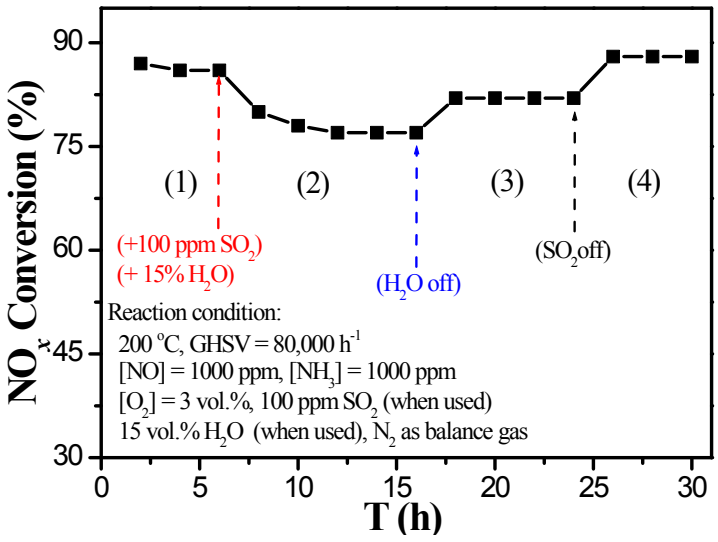

Fig. S4 Effects of H_2O and SO_2 on NO_x conversion over the $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalyst at 200 °C

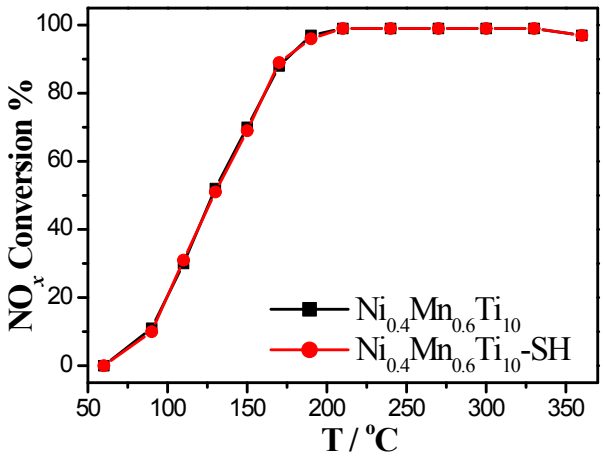

Fig. S5 Stability test result of $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalyst. Reaction conditions: [NO] = [NH_3] = 1000 ppm, [O_2] = 3 vol. %, N_2 as balance gas and GHSV: 40,000 h^{-1}.

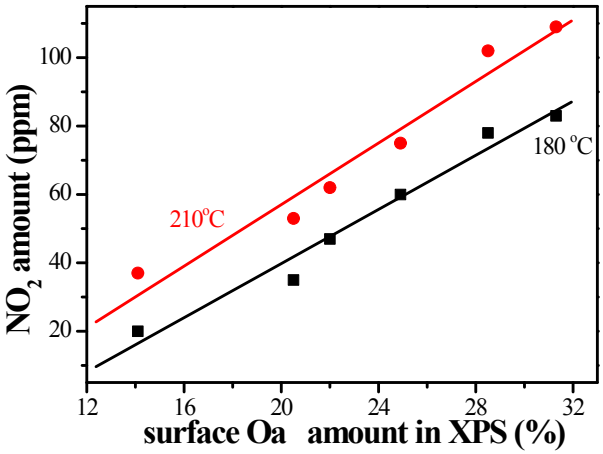

Fig. S6 Plots of surface O_α amount based on XPS (%) *versus* NO_2 amount in NO oxidation.

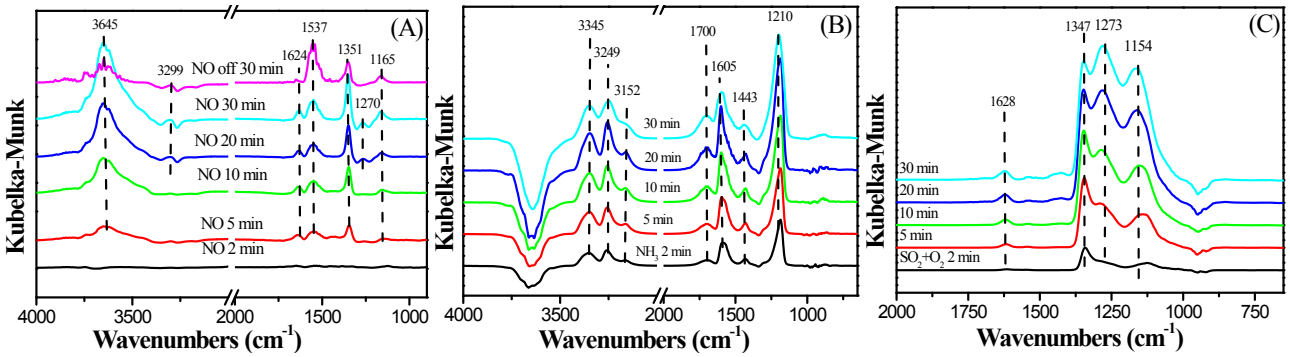

Fig. S7 *In situ* DRIFTS on the $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalyst at 240 °C for different time:

(A) NO adsorption, (B) NH_3 adsorption, (B) $SO_2 + O_2$ adsorption.

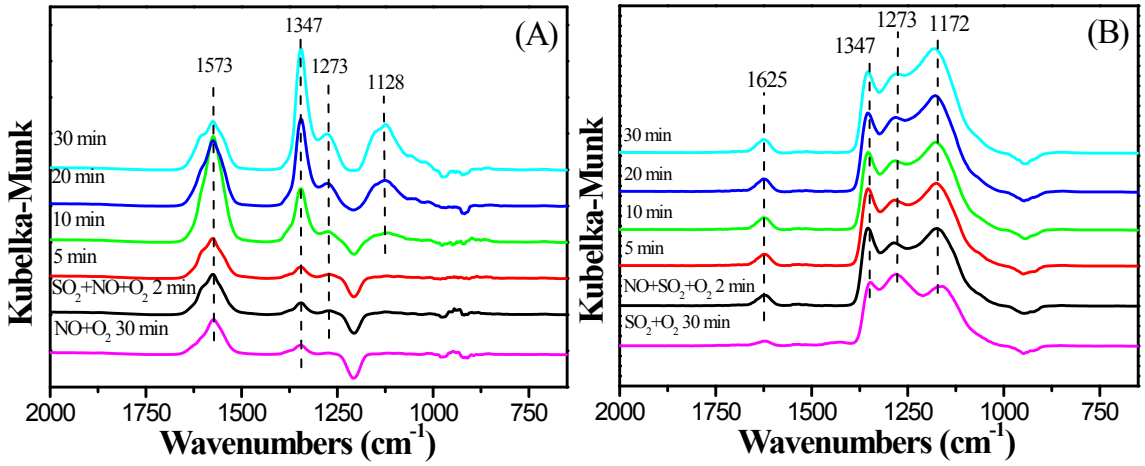

Fig. S8 *In situ* DRIFTS of the SO_2 + NO + O_2 reaction on the $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalyst at 240 °C.

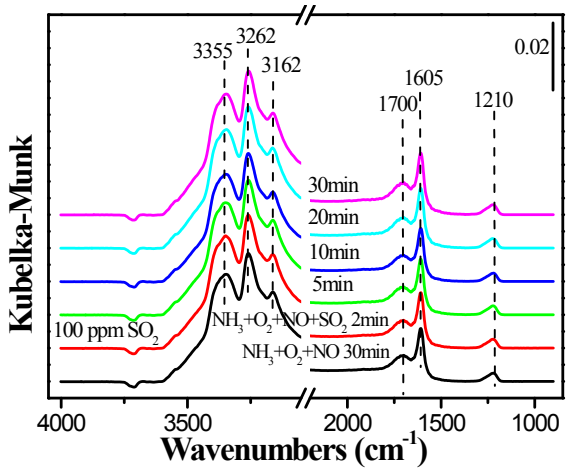

Fig. S9 *In situ* DRIFTS of the reaction on the $Ni_{0.4}Mn_{0.6}Ti_{10}$ catalyst at 240 °C, during which the NH_3 + O_2 + NO were let in firstly, secondly NH_3 + O_2 + NO + SO_2.