Supporting information

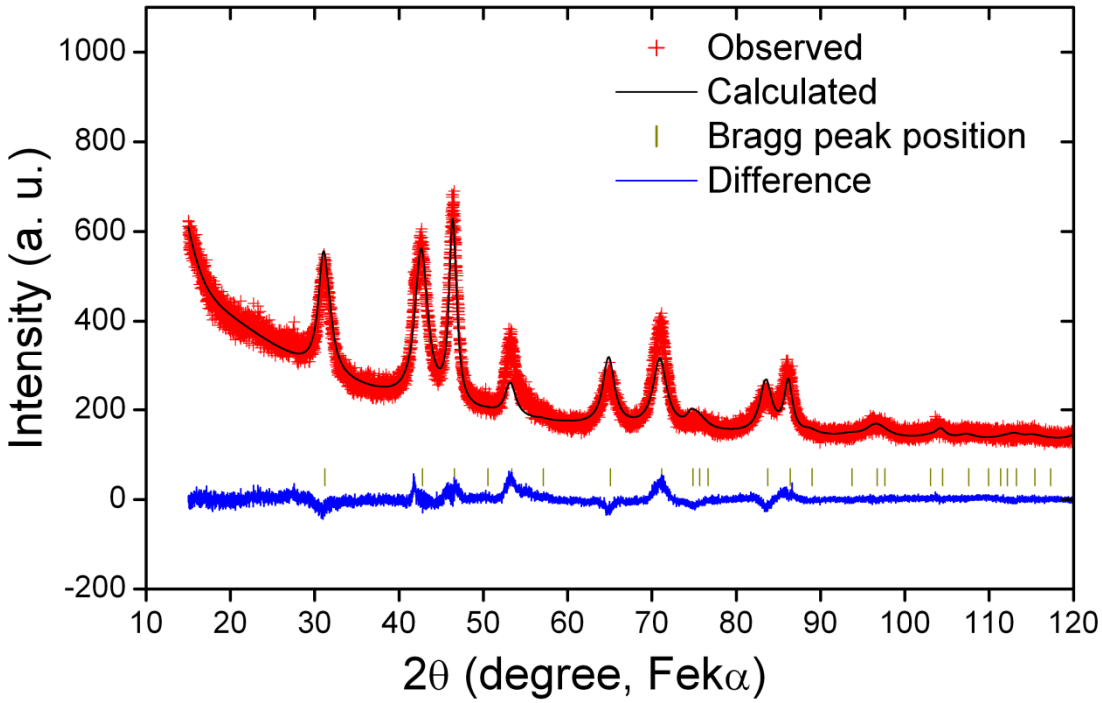

Fig. S1 Rietveld refinement of the XRD pattern of m-$NiMn_2O_x$-600 with a hematite structure.

Table S1: Crystallographic data for m-$NiMn_2O_x$-600 after Rietveld refinement

$P4_2/mnm$, $a = b = 4.8976(10)$ Å, $c = 13.602(4)$ Å, $V = 282.54(11)$ $Å^3$

Atom	x/a	y/b	z/c	multi	occupancy
Mn	0.0	0.0	0.3550	12	0.6667
Ni	0.0	0.0	0.3550	12	0.3333
O1	0.4758(1)	0.4758(1)	0.0	18	1.000

R-factors: $R_{wp} = 13.18\%$, $R_p = 9.72\%$

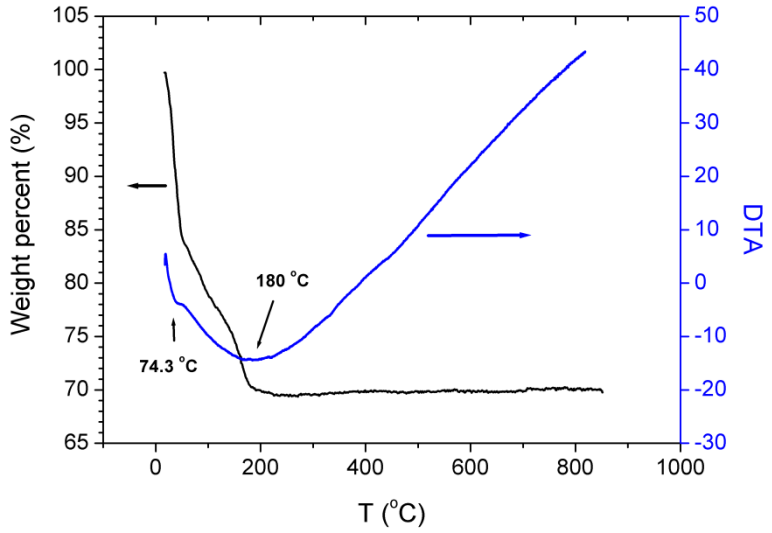

Fig. S2 TG-DTA curve of $Ni(NO_3)_2$•$6H_2O$ and $Mn(NO_3)_2$•$4H_2O$ loaded KIT-6 composite.

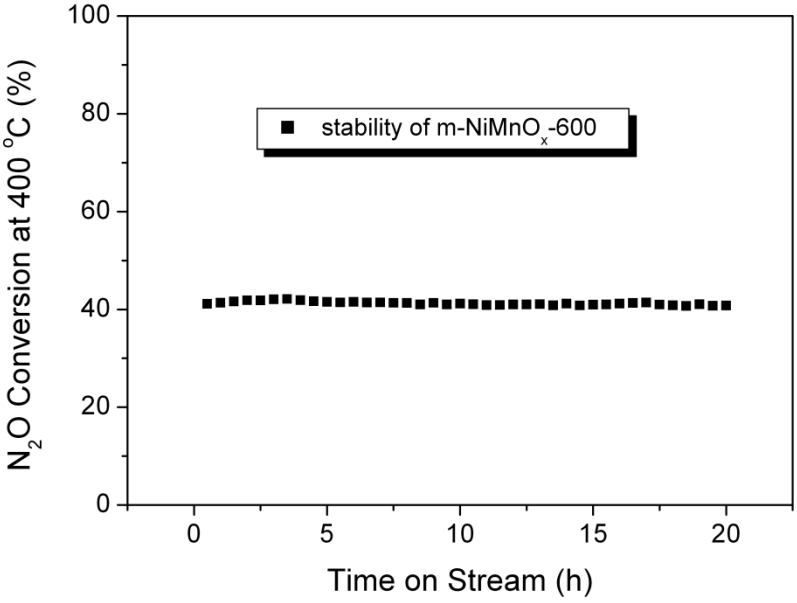

Fig. S3 Stability of m-$NiMnO_x$-600 as a function of time on stream. The catalyst was first pretreated in 20% He (balance He) at 400 °C for 1 h. The system was flushed by He, 0.5% N_2O (balance He) flowed into the catalyst bed, and the reaction temperature kept at 400 °C. The existing stream was periodically analyzed by GC to determine $[N_2O]_{out}$. After on stream for 20 h, the catalyst was cooled to near room temperature, and the existing stream was analyzed again to obtain $[N_2O]_{in}$.