Supplementary Information

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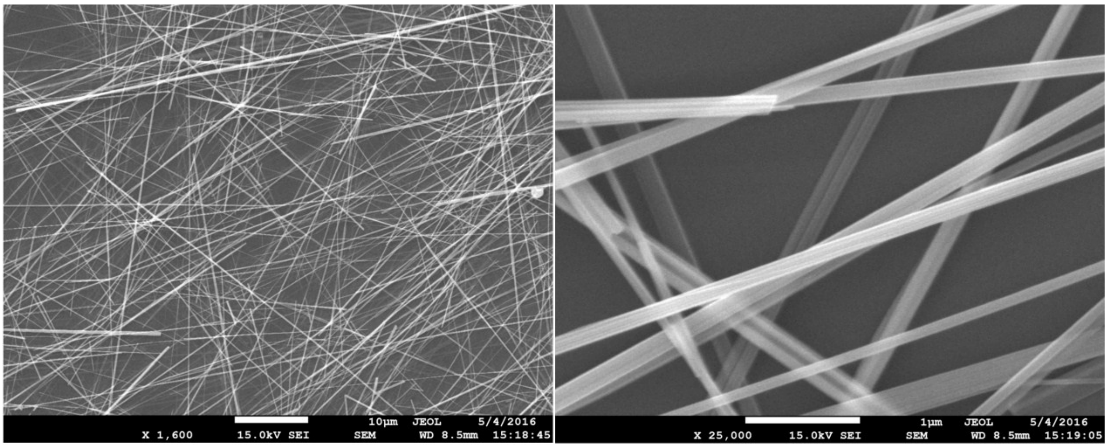

Fig. S1 SEM images of α-MnO_2 nanowire

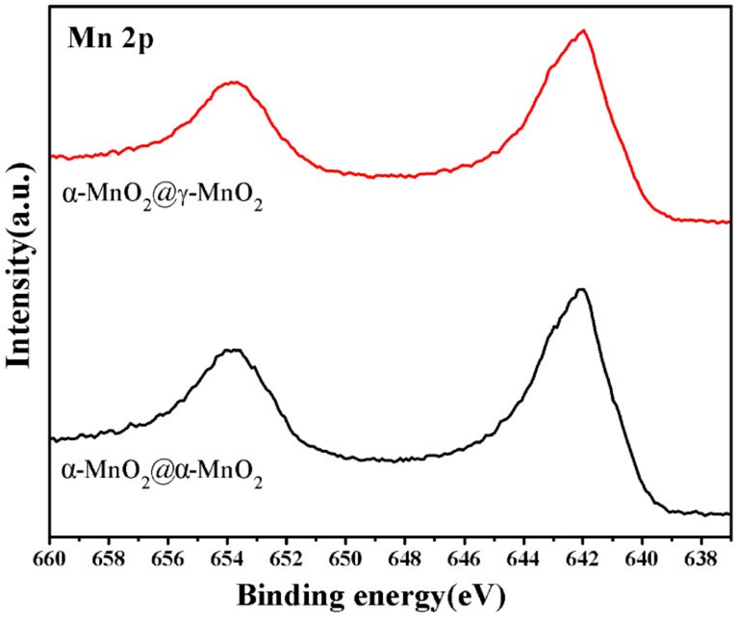

Fig.S2 Mn2p of the core/shell MnO_2@MnO_2.

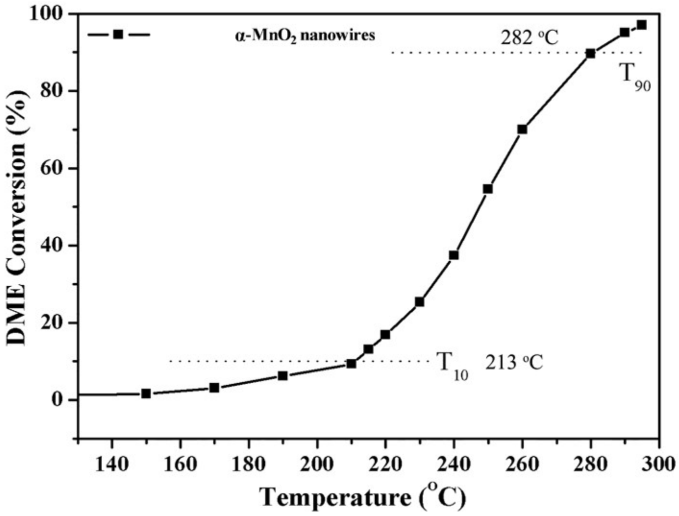

Fig.S3 the catalytic combustion activity of α-MnO_2 nanowire. From the curve, we can see that the T_{10} and T_{90} of MnO_2 nanowire is higher than those of the MnO_2@MnO_2, demonstrating that it has poor activity.

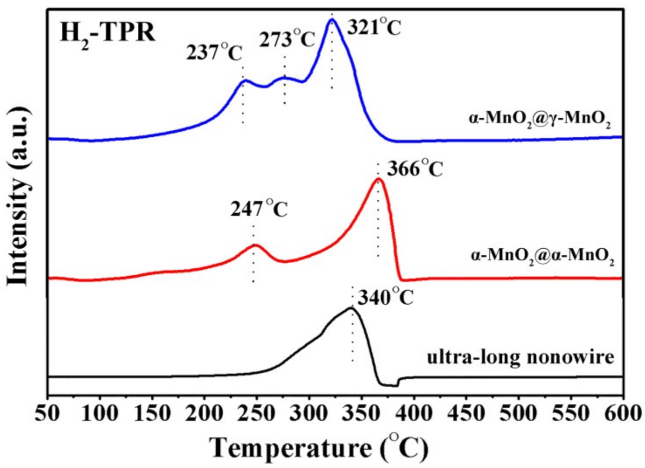

Fig.S4 TPR result of the MnO_2@ MnO_2 and MnO_2 nanowire. The MnO_2@MnO_2 catalysts have higher reducibility than that of the backbone α-MnO_2, and this is attributed to the synergic effect of the core and shell MnO_2.

Table S1 Some of the reported catalysts for DME combustion

Catalyst	T_{10}/°C	T_{90}/°C	Reference
α-MnO_2@γ-MnO_2	171	220	Our work
$CoFe_2O_4$	*ca.*300	*ca.*410	1
2PtAl	106	*ca.310*	2
$LaMnO_3$	210	295	3
$Zn_{0.8}Mn_{0.2}Fe_{2.4}O_4$	257	276	4
BaNi0.8Mn0.2Al11O19-*δ*	130	*ca.*340	5
α-MnO_2	160	172	6
Cu-OMS-2	171	180	7
Ce-OMS-2	149	159	8

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