

Electronic Supplementary Information (ESI):

Mn_3O_4 Doped with Highly Dispersed Zr Species: A New Non-Noble Metal Oxide with Enhanced Activity for Three-Way Catalysis

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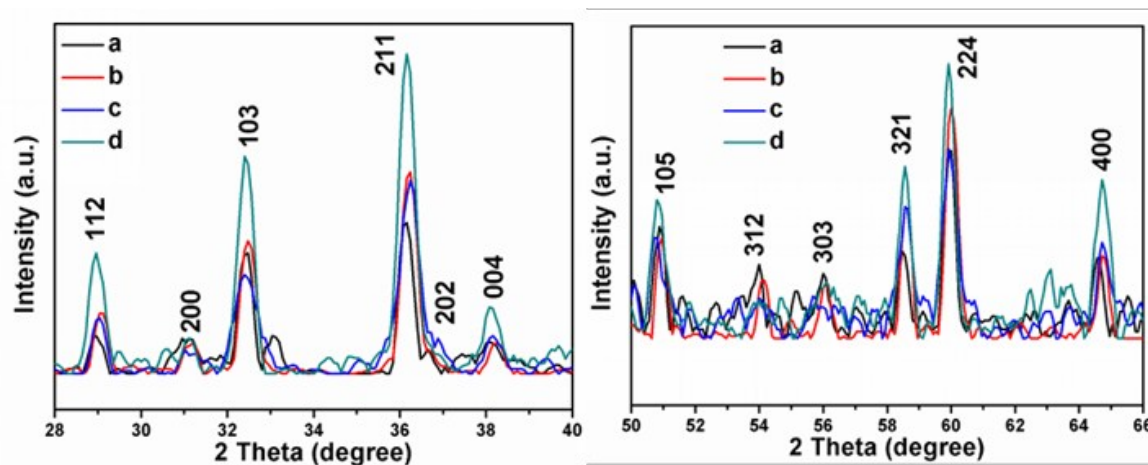


Fig. S1 XRD patterns of the samples (a) ZM-0, (b) ZM-1, (c) ZM-2, (d) ZM-3 in 28°-40° and 50°-66°.

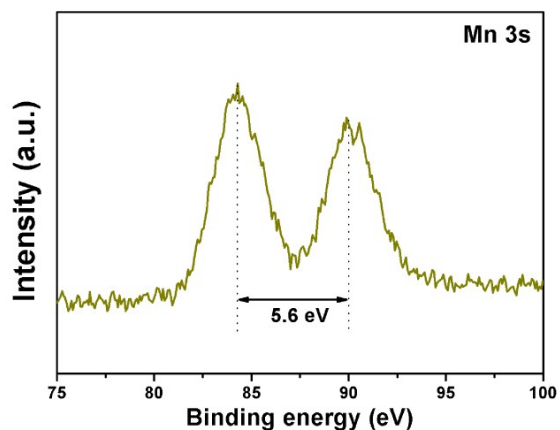


Fig. S2 Representative XPS spectra of the ZM-2 samples: Mn 3s.

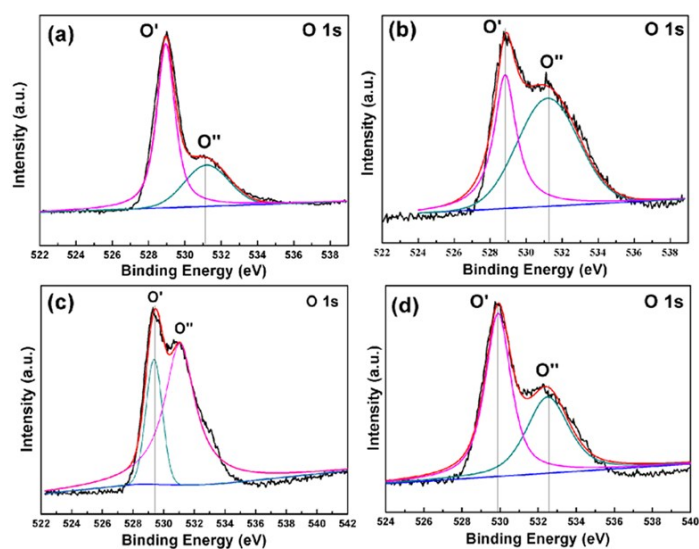


Fig. S3 Representative XPS O1s spectra of different samples: (a) ZM-0, (b) ZM-1, (c) ZM-2, (d) ZM-3.

Samples	ZM-0	ZM-1	ZM-2	ZM-3
Area of H ₂ -TPR	821.8	1837.5	1905.9	1643.3

Table S1 Areas of H₂-TPR of different samples.

Samples	CO Conversion		NO Conversion		C ₂ H ₆ Conversion	
	T ₅₀	T _C	T ₅₀	T _C	T ₅₀	T _C
ZM-0	248	439	366	459	461	500
ZM-1	197	270	276	405	290	440
ZM-2	168	228	241	344	311	400
ZM-3	229	361	348	415	317	418

Table S2 The catalytic activity date of samples.

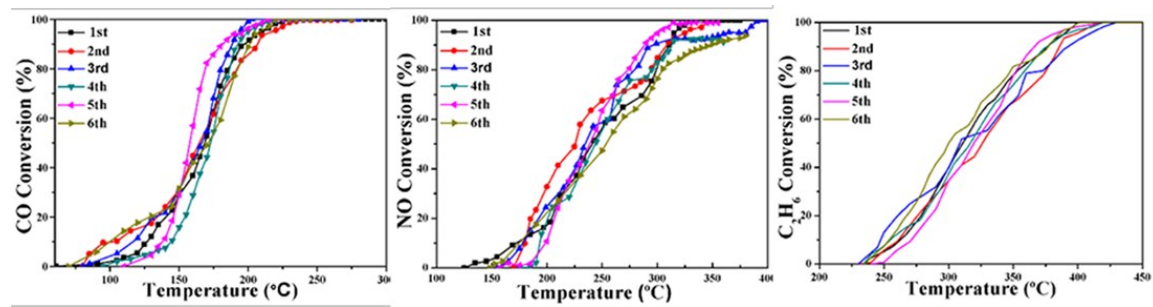


Fig. S4 Catalytic performance of as-prepared ZM-2, which was pretreated under 900 °C for 24 h in different cycles.