Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.
This journal is © The Royal Society of Chemistry 2016

Enhanced Preferential CO Oxidation on Zn_2SnO_4 Supported Au Nanoparticles: Support and H_2 Effects

A. Leelavathi, [a] N. Ravishankar[b] and Giridhar Madras[c]*

a. Centre for Nanoscience and Engineering, Indian Institute of Science, Bangalore-560012, India.

b. Materials Research Centre, Indian Institute of Science, Bangalore-560012, India.

c. Department of Chemical Engineering, Indian Institute of Science, Bangalore-560012, India.

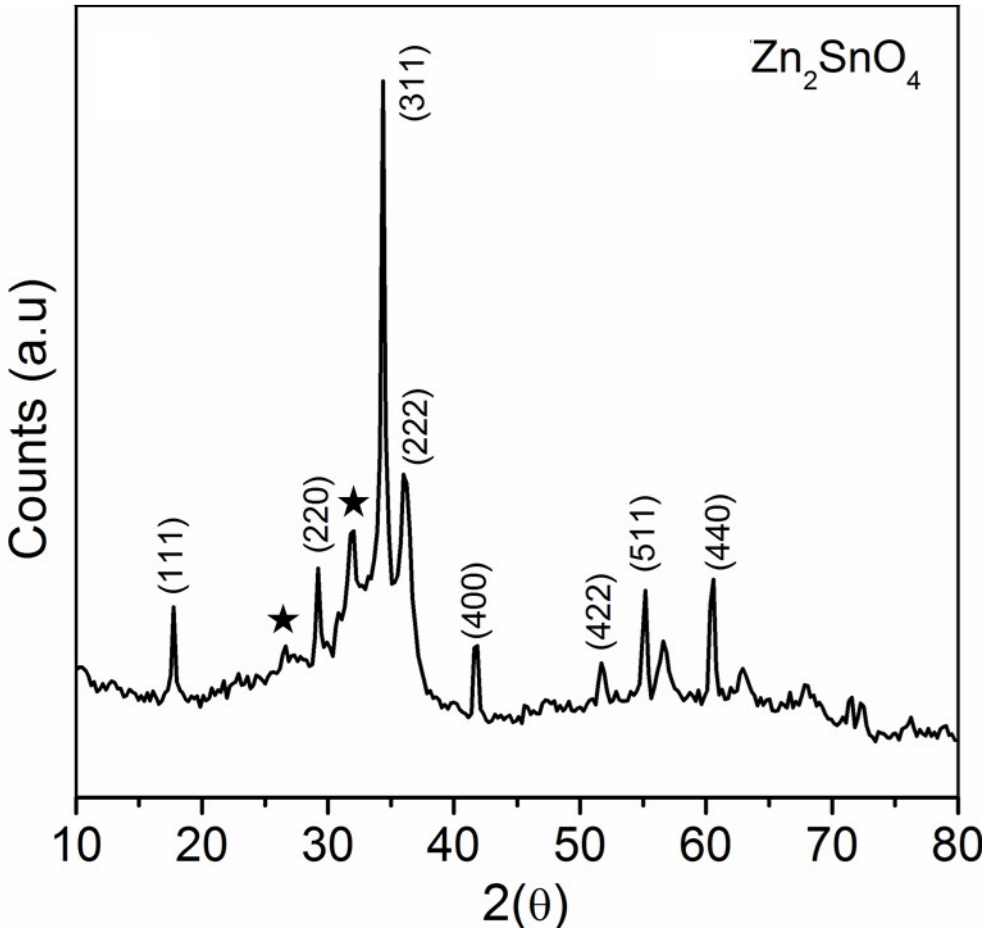

Fig. S1 XRD pattern of Zn_2SnO_4 inverse spinel structure, marked peaks corresponds to impurity phase

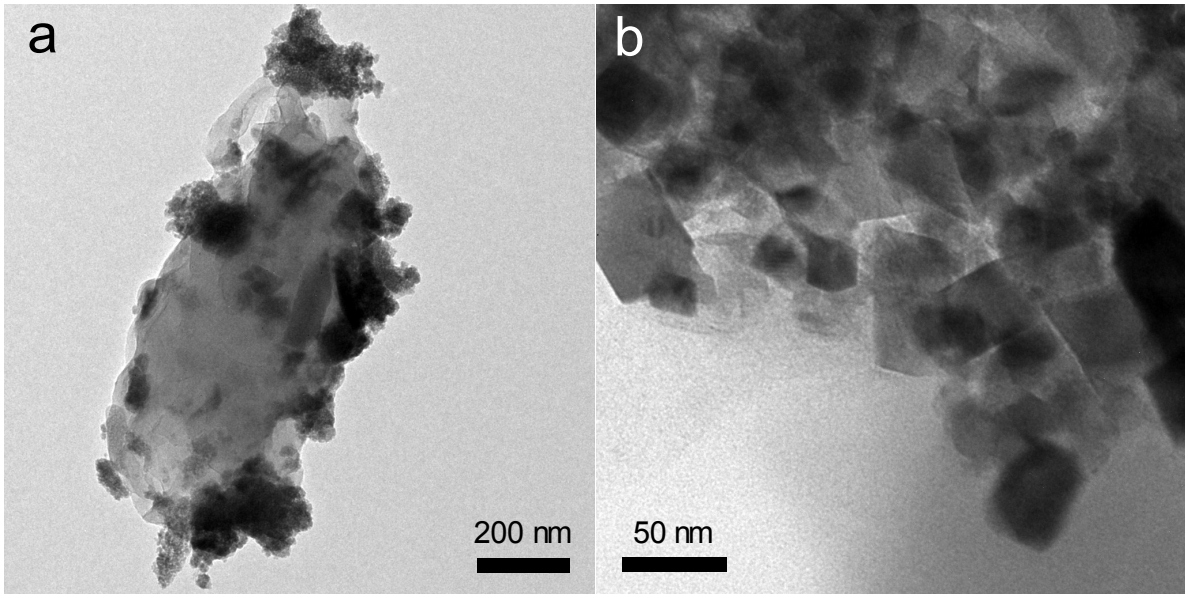

Fig. S2 Bright field TEM micrographs of combustion synthesized Zn_2SnO_4 at different magnifications.

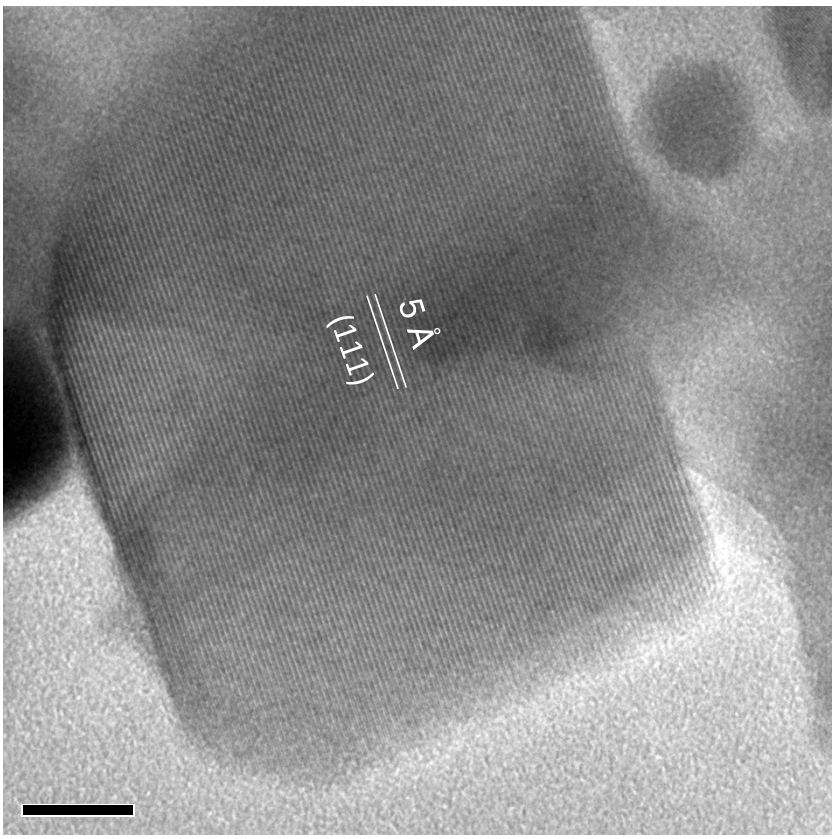

Fig. S3 High resolution TEM image of Zn_2SnO_4, illustrated d-spacing corresponds to crystallographic (111) plane of Zn_2SnO_4.

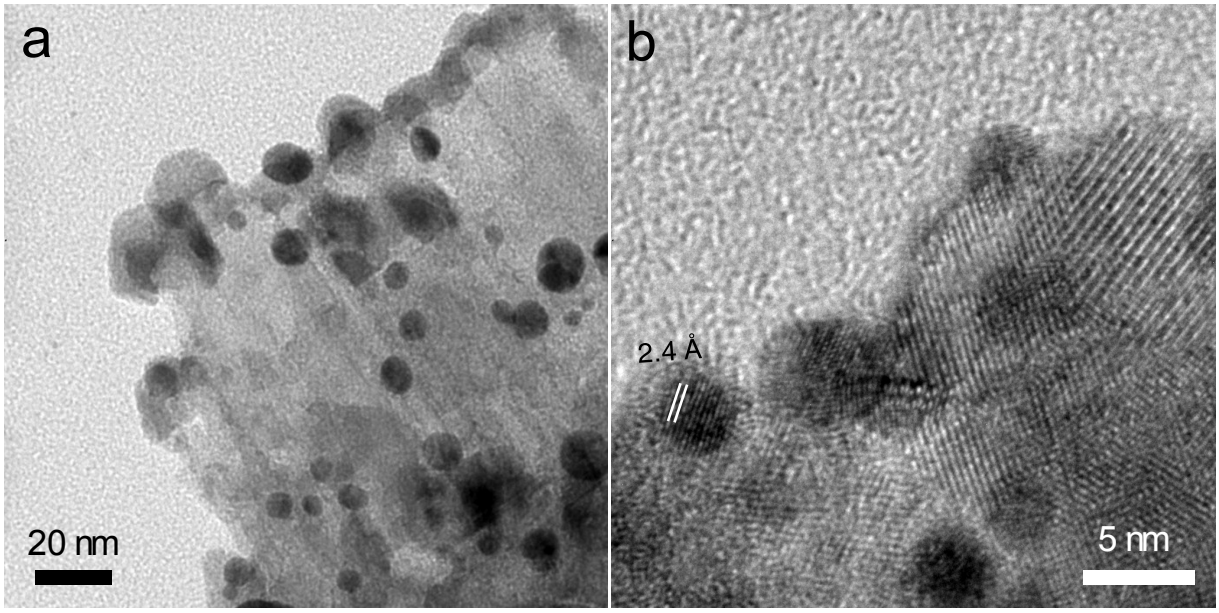

Fig. S4 (a) Bright field and (b) corresponding high-resolution TEM micrographs of Au/Zn_2SnO_4 the marked lattice spacing corresponds to Au (111) plane.

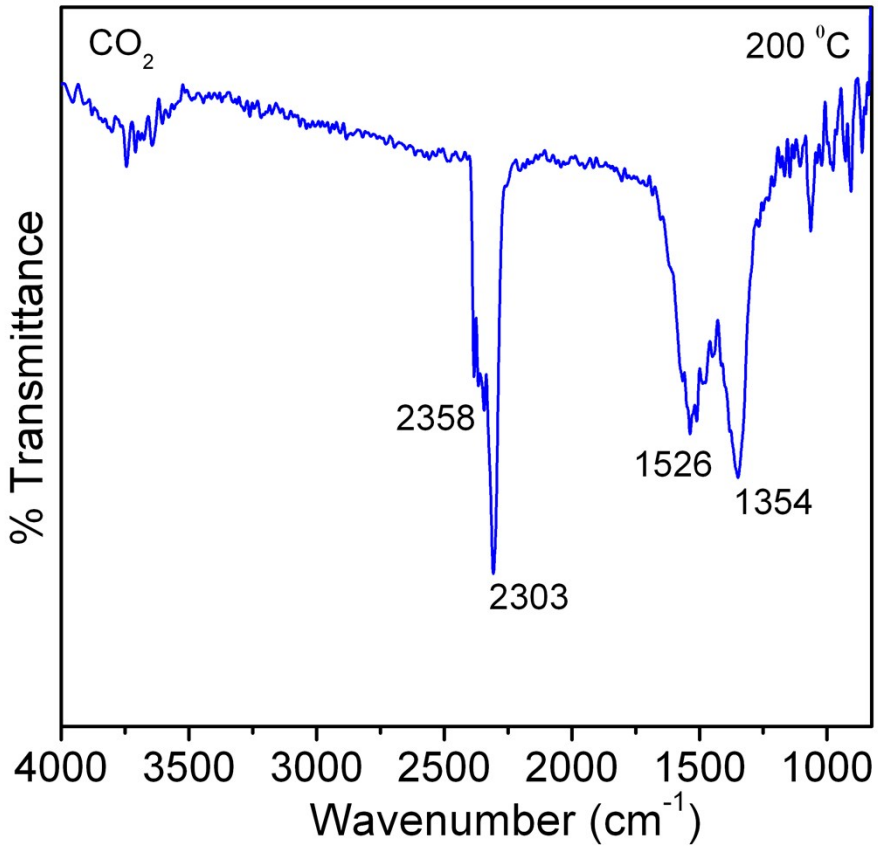

Fig. S5 DRIFT spectra recorded during flow of CO_2 on Zn_2SnO_4 at 200 ^oC. Carbonates signals along with gases CO_2 peaks are observed.

Au/Zn_2SnO_4	Relative Intensity Ratio of Au		
	Au^0	Au^{1+}	Au^{3+}
As-synthesized	1	0.34	0.29
After COX	1	0.30	0.15
After PROX	1	0.27	0.09
After CO TPR	1	0	0

Table S1 XPS relative intensity ratios of Au oxidation state (AU 4f) in Au/Zn_2SnO_4 at different experimental conditions.

Au/Zn_2SnO_4	Zn-carbonates (Binding Energy in eV)	Zn-V_o (Binding Energy in eV)	Sn-Vo and carbonates (Binding Energy in eV)
As-synthesized	93.7 92.6	91.2 88.7	89.8 87.0
After COX	94.1 92.7	91.2 88.7	90.0 87.3
After PROX	94.5 92.7	91.3 88.7	88.9 87.4
After CO TPR	94.2 92.8	91.2 89.0	89.3 87.2

Table S2 XPS peak position of Zn 3p and Sn 4p in Zn/Au_2SnO_4 catalyst treated at different experimental conditions.

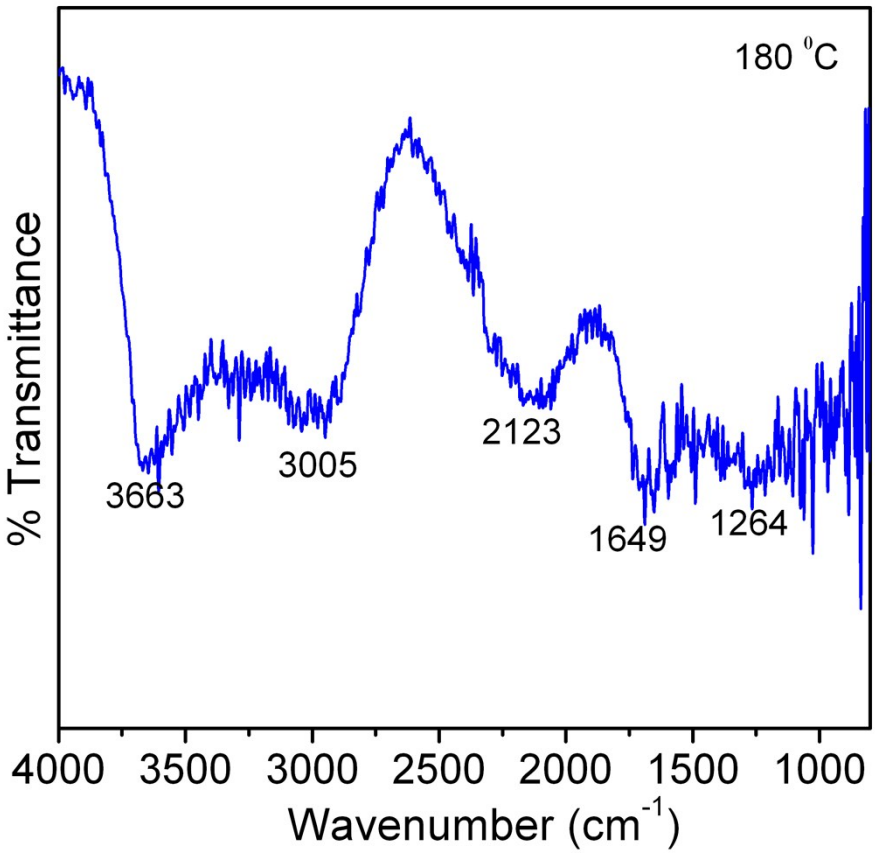

Fig. S6 DRIFT spectra recorded during PROX at 180 °C for Au/Zn_2SnO_4. Prominent, HOH vibrations are observed.