Supplementary information

Development of low temperature stoichiometric solution combustion derived transparent conductive ternary zinc tin co-doped indium oxide electrode

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S1: Combustion synthesis of IZTO with varying F:O ratios

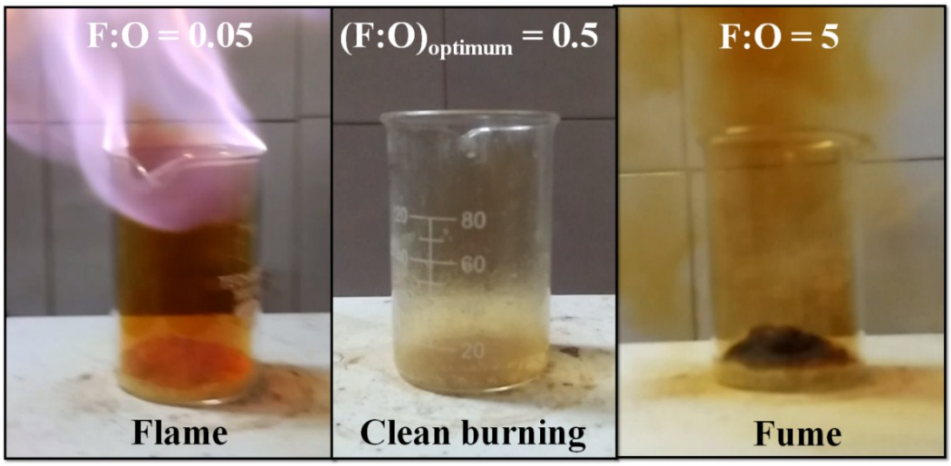

Fig. S1: Type of combustion reactions with varying F:O (= 0.05, 0.5 and 5); showing flame type (F:O = 0.05), smoldering type (F:O = 5) and clean burning (F:O = 0.5; optimum redox reaction). The fumes in case of fuel rich (F:O = 5) mixture is due to burning of excess carbon.

S2: Determination of precise lattice parameter of IZTO and combustion derived In_2O_3 powder

a). Combustion synthesis of In_2O_3

In_2O_3 synthesized through similar combustion process using acetylacetone as fuel and 2-methoxyethanol via balanced redox reaction (Eq. S1) followed by calcination at 600 °C for two hours.

$$8\ InN_3O_9 + 5\ C_5H_8O_2 \longrightarrow 4\ In_2O_3 + 25\ CO_2 + 20\ H_2O + 12\ N_2$$

…. (Eq. S1)

b). Determination of lattice parameter using Nelson Riley (NR) function

Precise lattice parameter can be determined using NR function ($\frac{cos^2\theta}{sin\theta} + \frac{cos^2\theta}{\theta}$). Lattice parameter of IZTO is compared with In_2O_3. Fig. S2 (a) and (b), shows plot of NR function vs lattice parameters for both IZTO and In_2O_3 respectively.

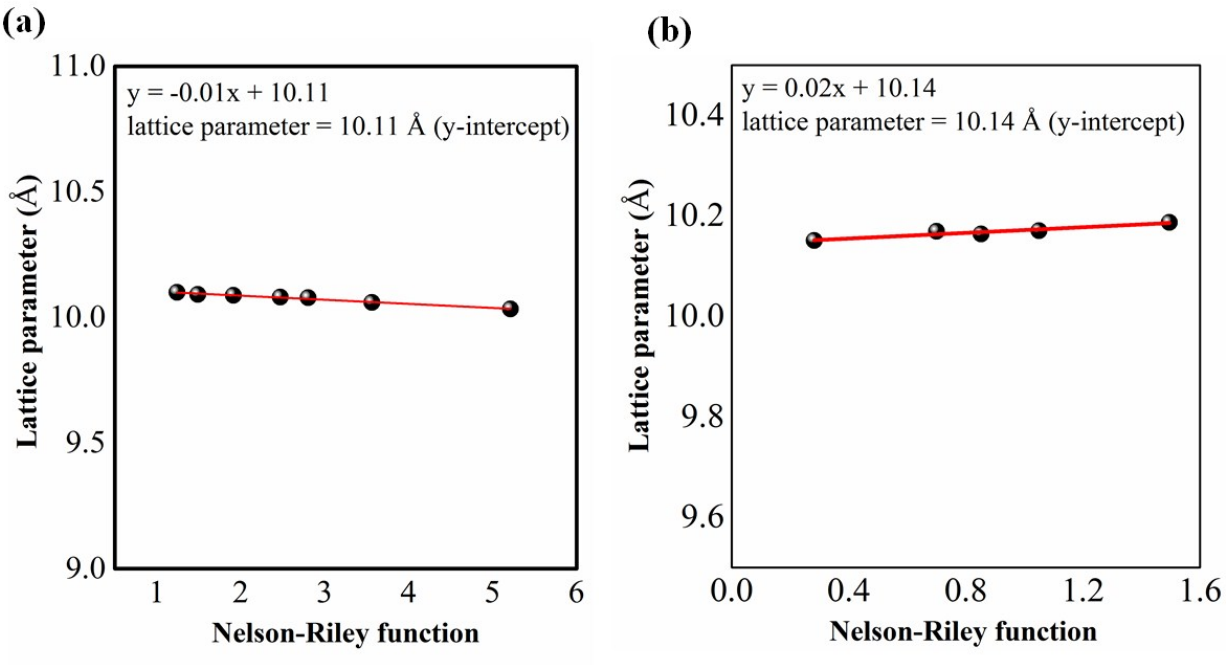

Fig. S2. Lattice parameter of (a) In_2O_3 and (b) IZTO using NR function

S3: Atom projected density of state of IZTO

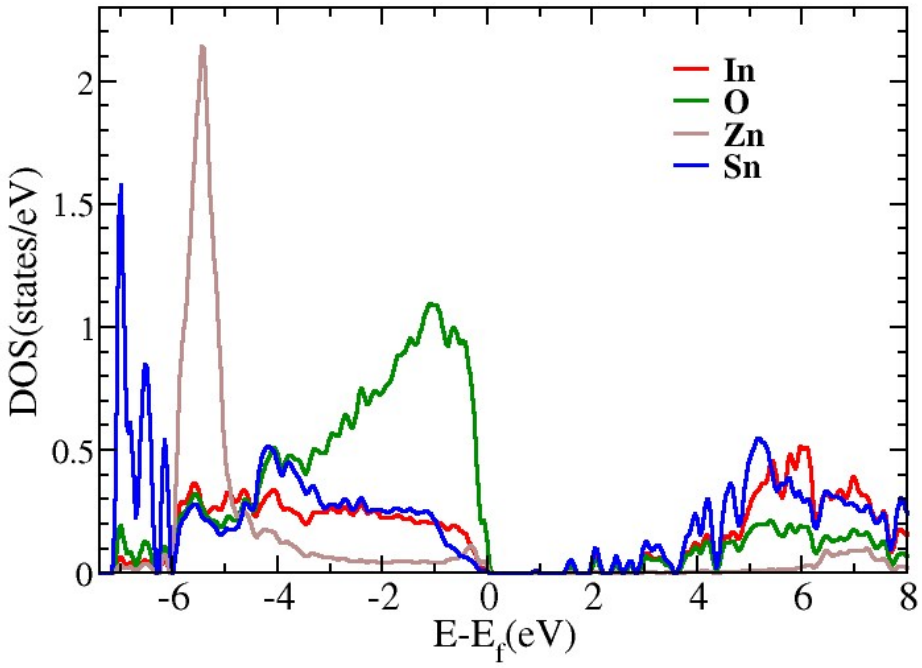

Fig. S3: The atom projected density of state of In, O, Zn and Sn are plotted with red green brown and blue color (online). Trap-states from doped Sn atom are visible in the band gap energy region.