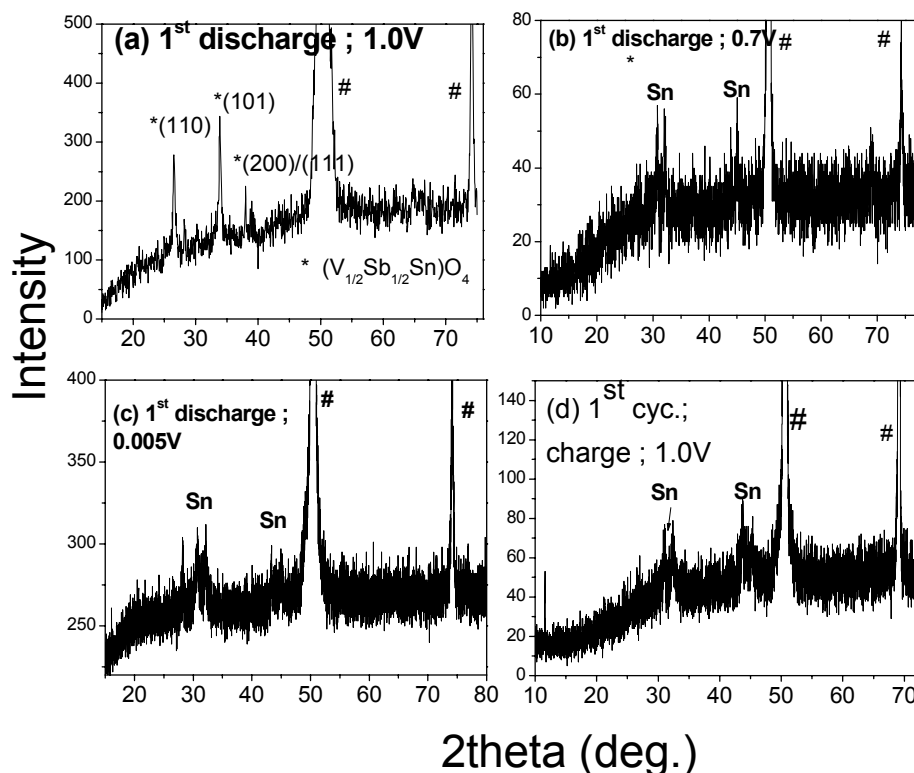


Supplementary information Fig. S1: Ex situ XRD patterns of the $M-(V_{1/2}Sb_{1/2}Sn)O_4$ cycled (1st cycle) electrodes in the discharged state at (a) 1.0 V, (b) 0.7 V and (c) 0.005 V and (d) in the charged state at 1.0 V. CuK α radiation. # Lines due to the Cu-foil current collector, * the parent compound (hkl) lines are indexed in (a).



As can be seen, Fig. S1a shows the lines due to the parent compound along with lines due to the Cu-foil substrate. In the discharged-state at 0.7 V (Fig. S1b), lines due to Sn-metal (regions of $2\theta = 30-33^\circ$ and $43-45^\circ$ are seen). The XRD pattern at 0.005 V (Fig. S1c) shows only broad low-intensity lines due to Sn-metal and lines due to Li-Sn alloy ($2\theta = 20-25^\circ$). Lines of Li-Sb alloy or Sb-metal are not observed. This could be due to very small particle size and lower Sb-content in comparison to Sn. The pattern at 1.0 V (fully charged-state, Fig. S1d) shows only lines due to Sn-metal.