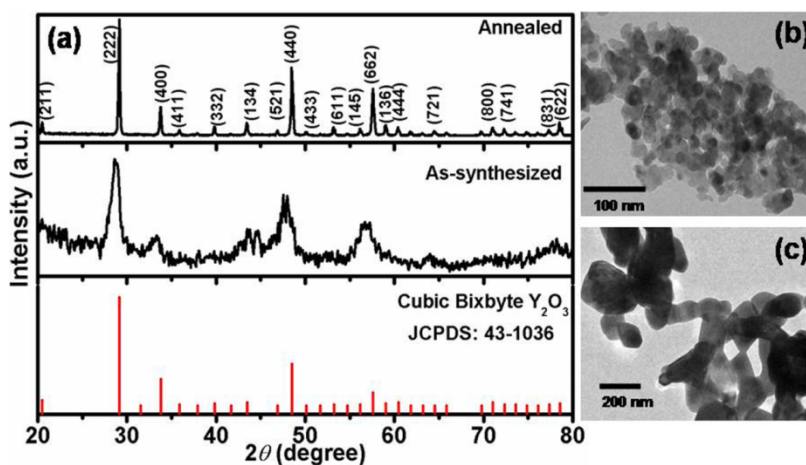
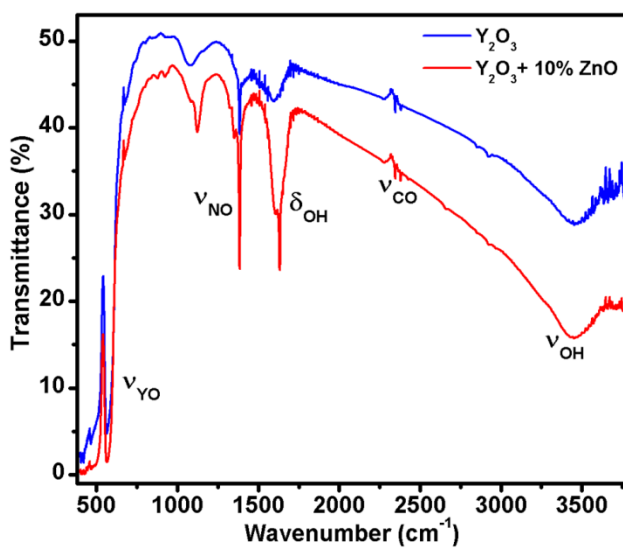


## Supplementary Information



**Fig. S1** (a) XRD patterns of as-synthesized and annealed  $Y_2O_3$  (JCPDS: 43-1036); TEM image of  $Y_{1.993}Dy_{0.001}Tm_{0.006}O_3$  phosphor (b) as-synthesized and (c) annealed



**Fig. S2** FTIR of undoped and 10 mol% codoped ZnO in  $Y_{1.993}Dy_{0.001}Tm_{0.006}O_3$