LIST OF TABLES

Page

Table 1.1: Physical parameters of ZnO 6

Table 2.1: Valence and ionic radii of possible candidate of dopant atoms. 27

Table 4.1: Positron annihilation lifetimes (τ) and corresponding intensities (I) of ZnO powder synthesized through coprecipitation route at different *p*H, dried at 80 ^{o}C @ 24 h and 250 ^{o}C @ 5 h, respectively. 76

Table 4.2: Reported and observed vibrational modes obtained from deconvoluted Raman spectrum of ZnO powder synthesised through sol-gel and combustion route, calcined at different temperatures. 84

Table 4.3: Positron annihilation lifetimes (τ) and corresponding intensities (I) of ZnO powder synthesized through sol-gel route, calcined at different temperature for 5h. 87

Table 4.4: Positron annihilation lifetimes (τ) and corresponding intensities (I) of ZnO powder synthesised through combustion route, calcined at 600, 800 and 1000 ^{o}C. 98

Table 5.1: The c/a ratio and lattice volume detection from Le-Bail refinement, Particle size and strain calculation from the W-H plot. 105

Table 5.2: Structural parameters of $Zn_{0.95}Co_{0.05}O$, $Zn_{0.96}Mg_{0.04}O$ and $Zn_{0.91}Co_{0.05}Mg_{0.04}O$ nanoparticles obtained after Le-Bail refinement of X-ray diffraction pattern and compared with JCPDS card. 115

Table 5.3: Vibrational modes observed from Raman spectra of $Zn_{0.95}Co_{0.05}O$, $Zn_{0.96}Mg_{0.04}O$ and $Zn_{0.91}Co_{0.05}Mg_{0.04}O$ nanoparticles are compared with the reported vibrational modes of ZnO. 121

Table 5.4: Positron annihilation lifetimes of $Zn_{0.95}Co_{0.05}O$, $Zn_{0.96}Mg_{0.04}O$ and $Zn_{0.91}Co_{0.05}Mg_{0.04}O$ nanoparticles and corresponding intensities. 126

Table 6.1: The reported (JCPDS) lattice parameter of monoclinic and hexagonal phase of SAO and wurtzite phase of ZnO compared with the extracted cell parameters after Le-bail profile fitting of SAO(20) composite calcined at 800 and 1000 ^{o}C. 137