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Annealing temperature dependence of optical properties of $SrTiO_3/BaTiO_3$ multilayered films on indium tin oxide[1] SATREERAT HODAK, THIDARAT SUPASAI, Department of Physics, Faculty of Science, Chulalongkorn University, Bangkok, 10330 Thailand, SOMSAK DANGTIP, PUNYACHAI LEARNGARUNSRI, NARONG BOONYOPAKORN, Department of Physics, Faculty of Science, Mahidol University, Bangkok 10400, Thailand, ANURAT WISITSORAAT, Nanoelectronics and MEMS Laboratory, National Electronics and Computer Technology Center, Pathumthani, 12120 Thailand — We have grown $SrTiO_3/BaTiO_3$ thin films with multilayered structures deposited on indium tin oxide (ITO) coated glass by a sol-gel deposition. The annealing temperatures were varied in the range of 300-650 $^\circ$C to study the change in optical properties of the films. The absorption edge shifts to longer wavelengths with increasing in annealing temperature. The band gap energy of the films increases in the 3.64-4.19 eV range and the grain size becomes smaller when the annealing temperature decreases. The film annealed at 650 $^\circ$C showed the maximum refractive index of 2.09-1.91 in the 450-750 nm wavelength range while the extinction coefficient was less than 0.05. The Urbach energy obtained from absorbance data for the multilayer films annealed at 500 $^\circ$C, 550 $^\circ$C and 600 $^\circ$C are 0.272 eV, 0.263 eV and 0.220 eV, respectively.

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