

Figure 6(a-c): Dependence of dielectric loss ($\tan\delta$) on absolute temperature after irradiation.

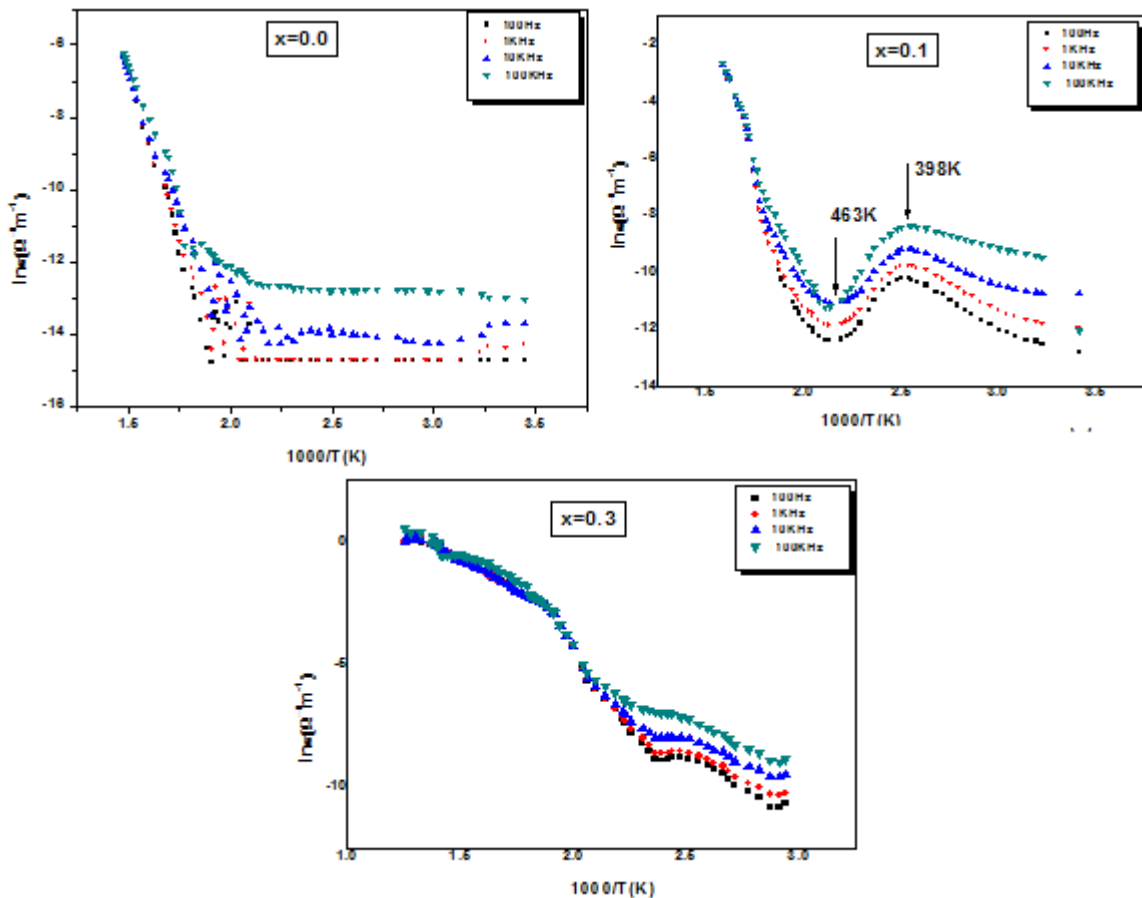


Figure 7(a-c): Dependence of ac conductivity (σ) on absolute temperature before irradiation.

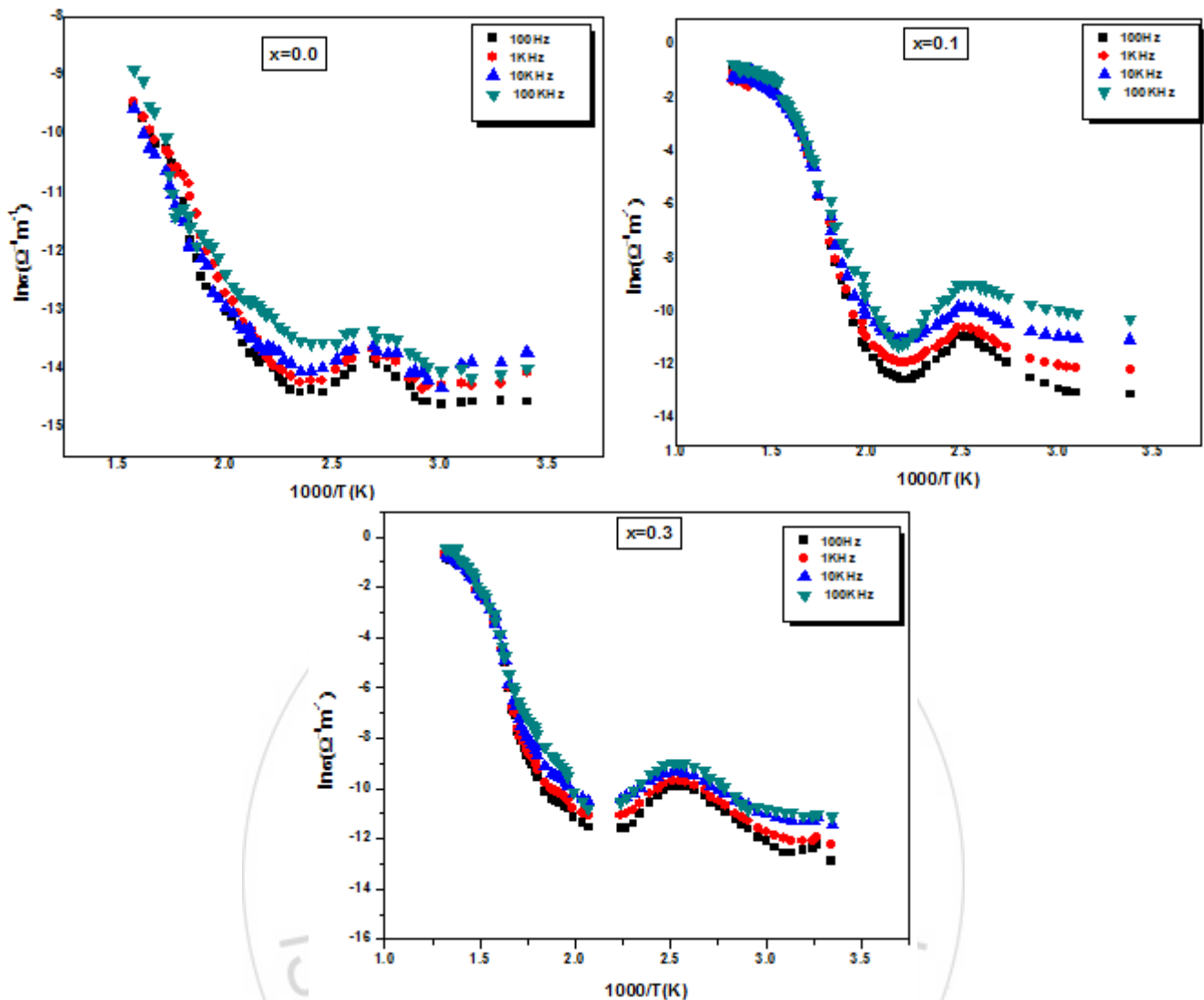


Figure 8(a-c): Dependence of ac conductivity (σ) on absolute temperature after irradiation.

References

- [1] M. Fiebig, J. Phys. D 38 (2005) R123.
- [2] K.F. Wang, J.M. Liu, Z.F. Ren, Adv. Phys. 58 (2009) 321.
- [3] C.W. Nan, M.I. Bichurin, S.X. Dong, D. Viehland, G. Srinivasan, J. Appl. Phys. 103 (2008) 031101.
- [4] J. Wang, J.B. Neaton, H. Zheng, V. Nagarajan, S.B. Ogale, B. Liu, D. Viehland,
- [5] V. Vaithyanathan, D.G. Schlom, U.V. Waghmare, N.A. Spaldin, K.M. Rabe, M. Wuttig, R. Ramesh, Science 299 (2003) 1719.
- [6] H. Béa, M. Bibes, M. Bibes, F. Ott, B. Dupé, X.H. Zhu, S. Petit, S. Fusil, C. Deranlot, K. Bouzehouane, A. Barthélémy, Phys. Rev. Lett. 100 (2008) 017204.
- [7] H.W. Jang, S.H. Baek, D. Ortiz, C.M. Folkman, R.R. Das, Y.H. Chu, P. Shafer, J.X. Zhang, S. Choudhury, V. Vaithyanathan, Y.B. Chen, D.A. Felker, M.D. Biegalski, M.S. Rzechowski, X.Q. Pan, D.G. Schlom, L.Q. Chen, R. Ramesh, C.B. Eom, Phys. Rev. Lett. 101 (2008) 107602.
- [8] N.A. Spaldin, M. Fiebig, Science 309 (2005) 391.
- [9] N.A. Hill, J. Phys. Chem. B 104 (2000) 6694.
- [10] M. Fiebig, Th. Lottermoser, D. Frohlich, A.V. Golesev, R.V. Pisarev, Nature (London) 419 (2002) 819.
- [11] M.A. Ahmed, N. Okasha and S.I. El-Dek, Nanotechnol. 19 (2008) p.065603.
- [12] R.D. Shanon, Acta Crystallogr. A 32 (1976) 751.
- [13] Jyoti Ranjan Sahu, C.N.R. Rao, Solid State Sciences 9(2007) 950.
- [14] H. O. Rodrigues, G.F.M. Pires Junior, J. S. Almeida, E. O. A.C. Rodrigues, M.A.S. Silva, A.S.B. Sombra, J. of Physics and Chemistry of Solids, 71 (2010) 1329.
- [15] D.H. Wang, W.C. Goh, M. Ning, C. K. Ong, Appl. Phys. Lett. 88 (2006) 212907.
- [16] M. Kumar, K. L. Yadav, J. Phys. 100 (2006) 74111.
- [17] M. Kumar, K. L. Yadav, J. Phys. Condens, Matter 18 (2006) L503.
- [18] G. I. Yuan, S.W. Or, J. Appl, Phys. 100 (2006) 024109.
- [19] A. Dutra, T.P. Sinha, J. Phys. Chem. Solids 67 (2006) 1484.
- [20] T.T. Ahmed, I.Z. Rahman, M.A. Rahman, J. Mater, Process, Technol, 152-154(2004) 797.
- [21] D.H. Wang, W.C. Goh, M. Ning, C.K. Ong, Appl. Phys. Lett. 84 (2004) 1731.
- [22] V.A. Khomchenko, D.A. Kiselev, M. Kopcewicz, M. Maglione, V.V. Shvartsman, P. Borisov, W. Kleemann,

- A.M.L. Lopes, Y.G. Pogorelov, J.P. Araujo, R.M. Rubinger, N.A. Sobolev, J.M. Vieira, A.L. Kholkin, J. Magn. Mater. 321 (2009) 1692.
- [23] J. M. Moreau, C. Michel, R. Gerson, and W.J. James, *J. Phys. Chem. Solids*, **32**(1971) 1315.
- [24] W.M. Zhu, and Z.G. Ye, *Ceram. Int.*, 30 (2004)1435.
- [25] A. Hussain, A. Begum, and A. Rahman, *Journal of Optoelectronics and Advanced Materials*, 12 (2010) 1019.
- [26] S.A.T. Redfern, J.N. Walsh, S.M. Clark, G. Catalan, J. F. Scott, arXiv:0901.3748v2. (2009).

