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Phase Transition studies of MnSb2-xTaxSb2O6

Recently, the trigonal modification (sg. P321) of MnSb2O6 has drawn significant attention as it could be an unusual type of multiferroic behaviour and weakly polar material [1]. The magnetic susceptibility of MnSb2O6 shows a short range ordering below 200 K and long range ordering is observed below the Neel temperature (TN = 12.5 K) resulting in an incommensurately ordered three-dimensional Heisenberg antiferromagnet [2]. MnTa2O6 adopts the orthorhombic MgNb2O6 structure type (sg. Pbcn) and it shows a monoclinic magnetic structure: P2'1/c symmetry at 4.2 K (TN = 4.4 K) [3]. In this solid solution, Ta could occupy the MnO interlayers and it will induce the decrease of the magnetic inter layer coupling. According to the Lab X-ray diffraction studies, a new tetragonal modification can be observed between x = 0.2 and 1.8. The powder can be refined as mixtures of the trigonal MnSb2O6 structure and a tetragonal tri-rutile modification, which is known for other MSb2O6 compounds, for the refinement from x = 0.6 to x = 1.2. The tri-rutile modification could be refined as the sole phase between x = 1.4 to 1.6. The orthorhombic MnTa2O6 modification could only be observed from x = 1.7 - 2.0. Interestingly, the tri-rutile modification has previously been described as a meta-stable modification for MnTa2O6 [4].

References

[1] R. D. Johnson, K. Cao, L. C. Chapon, F. Fabrizi, N. Perks, P. Manuel, J. J. Yang, Y. S. Oh, S-W. Cheong and P. G. Radaelli, Phys. Rev. Lett. 111 (2013) 017202
[2] J. N. Reimers and J. E. Greedan, J. Solid State Chem. 79 (1989) 263
[3] H. Weitzel and S. Klein, Solid State Comm. 12 (1973) 113
[4] S. Esmaeilzadeh and J. Grins, Solid State Sciences 4 (2002) 117

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