

Structure, stoichiometry and magnetic properties of the low dimensional structure phase LiCuVO_4

A.V.Prokofiev^{1*}, I.G.Vasilyeva², V.N.Ikorskii², V.V.Malakhov³, I.P.Asanov⁴ and
W.Assmus¹

¹*Physikalisches Institut, J.W.Goethe Universität, 60054 Frankfurt a.M., Germany*

²*Nikolaev Institute of Inorganic Chemistry, SB of RAS Novosibirsk 630090*

³*Boreskov Institute of Catalysis, SB of RAS Novosibirsk 630090*

⁴*Samsung Advanced Institute of Technology P.O.Box 111, Suwon 440-600, Korea*

LiCuVO_4 – a one-dimensional (1D) spin system and a 1D ionic conductor - has attracted much attention in recent few years. The measured magnetic properties were discussed considering the ideal composition and structure of the compound. However LiCuVO_4 is a defect phase.

The preparation techniques for powders as well as growth techniques for single crystals are considered on the base of investigated phase diagrams.

A systematic investigation of a series of single- and polycrystalline LiCuVO_4 samples by means of X-ray diffraction, X-ray photoelectron spectroscopy, differential dissolution analysis, and magnetic susceptibility measurement were performed. This study reveals a noticeable difference in stoichiometry and structure of the samples prepared by different ways. The magnetic properties are discussed with respect on phase inhomogeneity, nonstoichiometry and structural defects.

* Corresponding author.

Physikalisches Institut, J.W.Goethe Universität, Robert-Mayer-Str., 2-4, 60054 Frankfurt a.M., Germany
e-mail: prokofiev@physik.uni-frankfurt.de