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Far-infrared study of the CuO_2 chain layer magnetism in $Sr_{14}Cu_{24}O_{41}$[1] TOOMAS RÕÕM, D. HÜVONEN, U. NAGEL, National Inst. Chem. Physics and Biophysics, P. HAAS, B. GORSHUNOV[2], M. DRESSEL, 1. Phys. Inst., Uni. Stuttgart, Germany, J. AKIMITSU, T. SASAKI, T. NAGATA, Dept. of Physics, Aoyama-Gakuin Uni., Tokyo, Japan — $Sr_{14}Cu_{24}O_{41}$ consists of two-leg ladders and chains of copper ions. Planes of ladders and chains alternate in b axis direction. Oxygen holes, present in stochiometric $Sr_{14}Cu_{24}O_{41}$, and Cu^{2+} spins in the chain are coupled into Zhang-Rice spin singlet. Chain Cu^{2+} spins that are separated by Zhang-Rice singlets form spin dimers. It is known from inelastic neutron scattering studies that because of inter-chain coupling there are two weakly dispersing triplet modes in the chain layer. We found that these triplet modes are optically active. Light is absorbed at 77.80 and 87.54 cm^{-1} in zero magnetic field and $T = 4\,\mathrm{K}$. When magnetic field is applied along the c axis both resonances split. The triplet state g-factor is 2.048 ± 0.002 and 2.063 ± 0.006 for the lower and upper triplet. The results on the absorption line intensities and frequencies as a function of T, B_0, and light polarization are presented.

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