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Far-infrared and high field electron spin resonance study of magnetic and phonon excitations in the two dimensional cuprate $Na_5RbCu_4(AsO_4)_4Cl_2$[1] URMAS NAGEL, D. HÜVONEN, T. RÕÕM, Natl. Inst. of Chem. Phys. & Biophysics, Akadeemia tee 23, EE12618 Tallinn, Estonia, S. ZVJAGIN[2], J. KRZYSTEK, NHMFL, FSU, Tallahassee, S.-J. HWU, M. ULUTAGAY-KARTIN, X. MO, W. QUEEN, Dept. of Chemistry, Clemson University, J. A. CLAYHOLD, Physics Dept., Miami University — $Na_5RbCu_4(AsO_4)Cl_2$ is a novel low dimensional magnetic material, where the magnetic properties are determined by layers Cu_4O_4 tetramers [S.-J. Hwu *et al.*, J. Am. Chem. Soc., **124**, 12404 (2002)]. There is a second order phase transition at 17K, that likely involves the onset of antiferromagnetic order [J.A. Clayhold *et al.*, Phys. Rev. B, **66**, 052403 (2002)]. We have measured the far-infrared spectra and high field electron spin resonance spectra at low temperatures. A triplet excitation is observed at 12.68 cm^{-1}. The magnetic field dependent triplet components with the electron g-factor g_b=1.44 are split in zero field by 0.75 cm^{-1}. Several temperature dependent resonances are also observed. The results are being analyzed in the framework of a four-tetramer model.

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