

**$\mu$ SR-detected Softmode toward a Possible Phase  
Transition in disordered spin gap system  
(CH<sub>3</sub>)<sub>2</sub>CHNH<sub>3</sub>-Cu(Cl<sub>x</sub>Br<sub>1-x</sub>)<sub>3</sub>**

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The spin-gap system with a bond-disorder (CH<sub>3</sub>)<sub>2</sub>CHNH<sub>3</sub>-Cu(Cl<sub>x</sub>Br<sub>1-x</sub>)<sub>3</sub> abbreviated as IPA-Cu(Cl<sub>x</sub>Br<sub>1-x</sub>)<sub>3</sub> was reported by experiments on macroscopic quantities of the uniform susceptibility and the specific heat to show a magnetic order at low temperatures when the value of  $x$  is within the limited region between 0.44 and 0.87, and otherwise a gapped behavior[1]. We have investigated microscopically the ground state of the sample with  $x=0.35$  by muon spin relaxation ( $\mu$ SR) to observe that there exists a dynamical fluctuation of the magnetic field at low temperatures. Intensive study of the dependence of the muon spin relaxation rate  $\lambda$  both on temperature and longitudinal-field has shown that the characteristic frequency of the spin fluctuation decreases with lowering temperatures. This freezing behavior was interpreted as the soft-mode toward a possible magnetic phase transition at absolute zero such as Bose-glass phase [2].

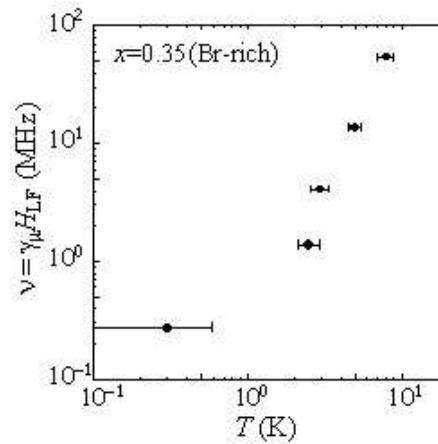


Fig. 1: Temperature dependence of the characteristic frequency of the spin fluctuation.

[1] H. Manaka et al. Phys. Rev. B63,104408 (2001), ibid B66, 064402 (2002).

[2] M. P. A. Fisher et al. Phys. Rev. B40, 546 (1989).