Electrons and Anions in $(TMTSF)_2FSO_3$ under pressure

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The title compound is a unique member of TMTSF family because of the tetrahedral counter anion with permanent electrical dipole moment. There is a physical interest concerning about new phenomena due to a possible coupling between conduction electrons and anion dipoles. Temperature-pressure phase diagram determined by transport measurements was reported [1]; a clear metal-insulator transition with an anion ordering occurred at 90 K at ambient pressure and there appear many subphases under pressure as shown in Fig. 1. We have performed NMR measurements under pressure of 6.5 kbar and found a metallic state with an appreciable charge disproportionation below 90 K. [2].

In the present study, NMR measurements at 14 kbar were performed to obtain further information on the electronic properties under pressure. A Korringa relation (T_1TK^2=const, where K and T_1 are the NMR shift and the relaxation time) was observed down to low temperatures. However, a broadening of NMR spectrum was observed below 80 K. The transverse relaxation rate, $1/T_2$, i.e., "homogeneous'' NMR width, was found to show a large enhancement in a temperature range close to the transition border (~80 K) as shown in Fig. 2. This suggests the existence of extremely slow dynamics in this temperature range.

[1] Y. J. Jo *et al.*, Phys. Rev. B67, (2003) 014516
[2] H. Satsukawa, ph D thesis, Gakushuin University (2007)

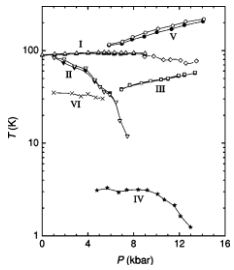

Fig. 1: T-P phase diagram (Phys. Rev. B67, (2003) 014516)

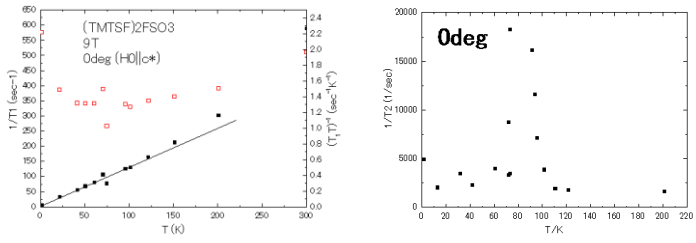

Fig. 2: Temperature dependence of T_1^{-1} and T_2^{-1}