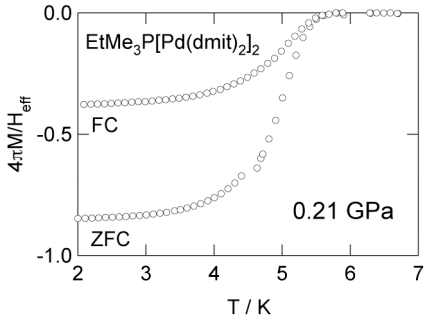
High Pressure Magnetic Study on the $[Pd(dmit)_2]$ Salts.

Yasuyuki Ishii,[1] Masafumi Tamura,[1] Reizo Kato[1]

1- Condensed Molecular Materials Lab., RIKEN, Wako, Saitama 351-0198, Japan; e-mail: yishii@riken.jp

Static magnetization is a quantity crucial for understanding physics of molecular conductors. Though reliable measurement of static magnetization is experimentally difficult under pressure, it provides useful information on peculiar pressure-induced phenomena, which are often observed for molecular conductors. We have succeeded in applying this frontier technique to a family of $[Pd(dmit)_2]$ based two-dimensional organic conductors (dmit = 1,3-dithiol-2-thione-4,5-dithiolate, C_3S_5) [1,2]. They are Mott insulators, in which S=1/2 Heisenberg spins are frustrated as a result of the triangular structure [3,4]. A variety of states including superconducting and metallic states, appear under pressure, depending on the counter cation. We report on the pressure-induced superconductivity in the $P2_1/m$ phase of $EtMe_3P[Pd(dmit)_2]_2$ (Et = C_3H_5, Me = CH_3), which has a spin-gapped state below 25 K at ambient pressure. Pressure dependence of the changes in paramagnetic susceptibility at the valence transition [5] in the Et_2Me_2Sb salt and at the antiferromagnetic ordering in the Et_2Me_2P salt is also discussed.



[1] Y. Ishii, M. Tamura, R. Kato *J. Phys. Soc. Jpn.* **2007**, *76*, 033704
[2] M. Tamura, Y. Ishii, R. Kato *J. Phys.: Condens. Matter* **2007**, 19, 145239
[3] M. Tamura, R. Kato *J. Phys.: Condens. Matter* **2002**, 14, L729
[4] R. Kato *Chem. Rev.* **2004**, 104, 5319
[5] M. Tamura, K. Takenaka, H. Takagi, S. Sugai, A. Tajima, R. Kato *Chem. Phys. Lett.* **2005**, 411, 133