High Pressure Study of the Two Dimensional Molecular Conductors, $Pd(dmit)_2$ Salts.

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A series of two dimensional organic conductors, $Et_xMe_{4-x}Z[Pd(dmit)_2]_2$ salts (x = 0, 1, 2, Z = N, P, As, Sb), are Mott insulators with anisotropic triangular lattice structure of the $Pd(dmit)_2$ dimers at ambient pressure. These compounds exhibit various physical properties depending on temperature and pressure (including uniaxial compression). It has been reported that the temperature dependence of the magnetic susceptibilities of some $Pd(dmit)_2$ salts was well explaned by the model of the spin-1/2 Heisenberg triangular antiferromagnet[1]. We have measured magnetic susceptibility and resistivity of this series of $Pd(dmit)_2$ salts under hydrostatic pressure. For $EtMe_3P$ salt, which exhibits a spin-Peierls transition at T_{SP} = 25 K under ambient pressure, T_{SP} slightly decreases with increasing pressure. Superconductivity is detected as a large diamagnetic signal below T_C = 5 K (0.20 GPa), corresponding to resistivity drop to zero. It is the first time that a bulk superconductivity is observed in a $Pd(dmit)_2$ salt.

[1]M. Tamura and R. Kato, J. Phys.: Condens. Matter **7**, L729 (2002).

Submitted : March 31, 2006

Preferred presentation : oral [ ]
poster [×]

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