NMR Study of Quantum Spin Liquid in an Organic Triangular Lattice Antiferromagnet
EtMe3Sb[Pd(dmit)2]2


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A quantum spin liquid state is realized in an organic spin 1/2 antiferromagnet on the triangular lattice, EtMe3Sb[Pd(dmit)2]2 [1, 2, 3]. No classical magnetic ordering exists down to 19 mK due to the quantum fluctuation and spin frustration, although the exchange interaction is 240 K [2, 4]. The enriched 13C nuclear spin-lattice relaxation rate T1-1 under a field of 7.65 T shows an exotic transition at 1.0 K accompanied with symmetry breaking or topological ordering. The rate T1-1 indicates that the excitations have no spin-gap above 1.0 K [1, 2], while below 1 K T1-1 shows the appearance of an excitation gap, which is a nodal one rather than a full gap [3]. We have confirmed that our NMR data surely reflect the spin state of this system by using two kinds of enriched samples [5]. The transition temperature has the field dependence, which is opposite to that of an ordinary spin system accompanied with a spin-gap formation owing to dimerization. Our recent measurement for a single crystal has revealed that T1-1 depends on the field direction below 5K. We will discuss the nature of quantum spin liquid, comparing with another thermal properties of this material.