Department of Materials Science, Graduate School of Engineering
Center for Research & Innovation in Electronic Functional Materials
Osaka Metropolitan University

Materials Science Colloquia 2022-23

Quantum properties in various spin models composed of organic radicals*

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Room 117, Bldg B3, Nakamozu Campus

Abstract

Quantum spins in condensed-matter physics create a variety of entangled states. Recent studies on quantum computing have attracted renewed interest in such quantum spin systems. Entangled many-body states in quantum spin systems can be used as resources for measurement-based quantum computation. In order to realize a variety of quantum spin state, we have focused our attention on the flexibility of the molecular orbitals in the verdazyl radicals. Our attempts in the spin arrangement design by using verdazyl radicals has demonstrated the formation of varieties of quantum spin systems, such as ferromagnetic-leg ladders, quantum pentagon, and frustrated square lattices, that had not been realized in the field of conventional organic and inorganic materials. Those spin models give rise to unconventional quantum states originated from highly entangled spins. In this lecture, some of our recent studies on quantum many-body phenomena will be reported.

* The lecture will be delivered in Japanese.
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