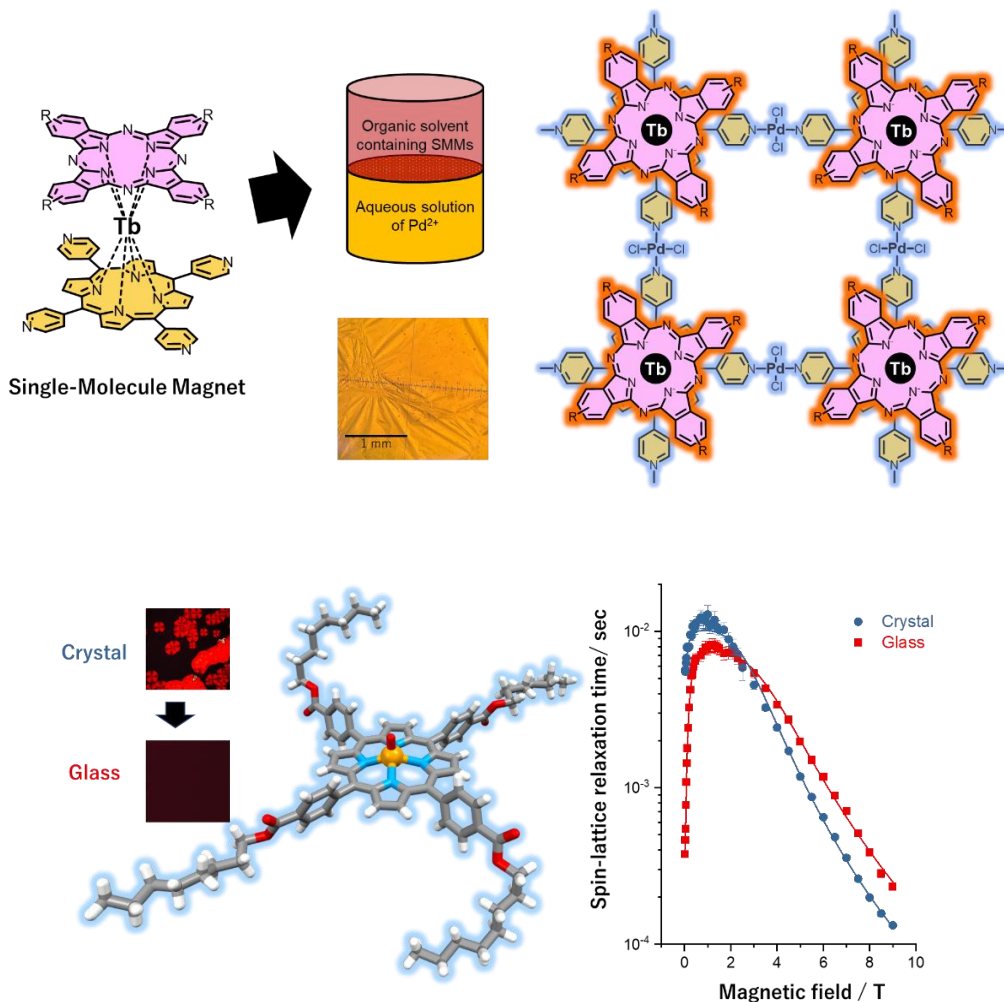


Construction of molecule-based magnetic materials and analyses of their magnetic properties

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Metal complexes with the unpaired electrons exhibit magnetic properties which arise from the electron spins. These magnetic complexes have been utilized for single-molecule magnets (SMMs). SMMs behave as the magnet at molecular level and are possible candidates for ultra-high density data storage devices. However, the regular arrangement of the SMMs is required to access the individual molecules.

We are developing the method to arrange the SMMs. A terbium(III)-based SMM shown in figure afforded the thin film upon the reaction with metal ions at hydrophobic-hydrophilic interface, indicating the formation of network structures in which the SMMs are arranged in a regular manner.

The electron spins on the magnetic metal complexes can also be utilized for the quantum bit. We are studying about the dynamical magnetic properties of the metal complexes surrounded by glass for the purpose of enhancing the magnetic relaxation times. Compared to the crystalline phase, the glass phase shows longer magnetic relaxation times at high magnetic field.

Keywords: Molecular magnetism, metal-organic frameworks, X-ray structure