Spin-Peierls Transition in Halogen-Bridged Mixed-Valence MMX Chain Compounds

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One-dimensional halogen-bridged mixed-valence dinuclear metal complexes, MMX chain compounds, have attracted much attention because of their characteristic physical properties originating from strong electron-lattice interactions and electron correlation [1].

The SQUID measurements of the novel 1-D iodo-bridged mixed-valence dinickel(II,III) complexes, $Ni_2(RCS_2)_4I$ (R=Et, *n*-Pr), revealed that the magnetic susceptibilities abruptly drop to singlet states accompanying by the spin-Peierls transition around 45 K. The X-ray diffraction images measured using the LTV X-ray camera at the SPring-8 BL02B1 showed superlattice reflections corresponding to 2-fold repetition length of the MMX units below 40 K. Single crystal structure analysis of $Ni_2(EtCS_2)_4I$ at 26 K including the superlattice reflections revealed the distorted structure like the ACP states observed for the LT phase of $Pt_2(RCS_2)_4I$ (R=Et, n-Bu) [1].

[1] Mitsumi M., Kitamura K., Morinaga A., Ozawa Y., Kobayashi M., Toriumi K., Iso Y., Kitagawa H., Mitani T., *Angew. Chem. Int. Ed*., 2002, **41**, 2767.

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