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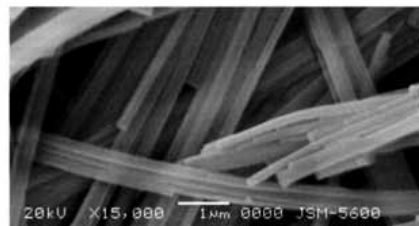
## Crystal Structure Analysis of a Nanowire Crystals Composed of Metal Complex Assembly

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In the nanometer regime, the size and shape of materials strongly influence their inherent properties. One-dimensional (1-D) inorganic nanocrystals indeed show novel optical, electronic, and magnetic behaviors so that they have been emerged as key components in the fabrication of nanodevices. However, nanosize 1-D materials based on organics and organic-inorganic hybrids such as metal complexes are rarely investigated because of the lack of efficient synthetic methods.

In this work, we describe 1-D nanosize crystal based on Cu(II) complex assembly. Mixing of CuCl<sub>2</sub>, Na<sub>2</sub>pzdc, and bpy solutions in the presence of poly(vinylsulfonic acid, sodium salt) (PVSA) afforded a sky-blue precipitate. A scanning electron microscopy (SEM) image of the product shows a large quantity of nanowire structures with diameters in the range between 100-400 nm (Figure 1). The nanowires are rather straight and have a



**Figure 1.** SEM image of nanowire structures based on Cu complex.

uniform diameter along the entire length.

To determine the detailed crystal structure of the nanowires, single crystal X-ray diffraction experiments at SPring-8 BL02B1 facilities were performed. After collection of data for the crystal, we could determine the unit cell dimensions (monoclinic,  $a = 9.8177 \text{ \AA}$ ,  $b = 34.7235 \text{ \AA}$ ,  $c = 9.952 \text{ \AA}$ ,  $\beta = 91.952^\circ$ ,  $V = 1991.35 \text{ \AA}^3$ ). However, the further structure analysis was difficult due to weak diffraction intensities from the too small crystal.

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## Analysis of Single Crystal Structure of Porous Coordination Polymer with Flexible Frameworks

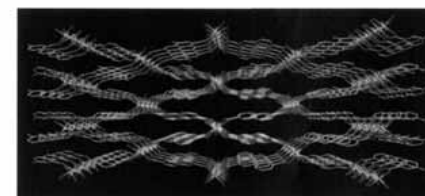
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Porous coordination polymer, which constructed by organic ligand and transition metal ion are paid much attentions as novel porous materials because of their high designable framework and high crystallinity. Recently, porous coordination polymers with flexible frameworks are spotlighted. These flexible porous coordination polymers show guest-responsive structure transformation with keeping crystallinity that are not observed in well-known adsorbents (zeolite, mesoporous silica, etc.). Although the importance of analyzing their flexible crystal structure thoroughly, it is quite difficult to observe the crystal structure by single crystal analysis because of the quality of single crystal of flexible coordination polymers are often bad (too small, unstable). In this report, we tried to observe the crystal structure of highly flexible porous network by single crystal X-ray diffraction experiments at

SPring-8 BL02B1 facilities.

The crystal structure of porous compound of Al<sup>3+</sup> and 2,6-naphthalenedicarboxylate (2,6-naph) which shows selective CO<sub>2</sub> gas adsorption is successfully observed (Fig. 1). Three-dimensional network is constructed and the 1D channels are existed along the  $c$  axis (cross section of pore is about  $1.5 \times 8 \text{ \AA}^2$ ).



**Fig. 1** Crystal structure of [Al(OH)(2,6-naph)]<sub>n</sub>

The micropores are surrounded by  $\pi$  aromatic ring of 2,6-naph and the rings may be able to rotate to some extent. It can be considered that this hydrophobic and flexible pore plays a role of selective gas sorption.