DSCM 26P **MECHANICAL PROPERTIES OF ONE-DIMENSIONAL COORDINATION POLYMER [Cu(adi)(4-pyao)$_2$]$_n$**

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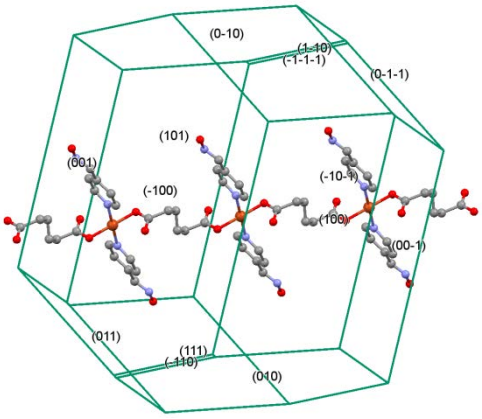
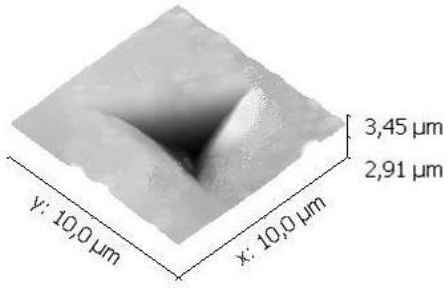
Blue block crystals of title compound, [Cu(adi)(4-pyao)$_2$]$_n$ **1** were obtained by blending the solution of copper (II) fluoride with 4-pyridine-aldoxime (4-pyao) and adipic acid (H_2adi). X-ray single crystal structure analysis revealed that **1** crystallizes in the triclinic space group *P*-1 (No 2). The metal N_2O_2-square-planar geometry is completed by two N-pyridine and two carboxylic oxygen atoms. The adipate dianions act in the *bis*-monodentate coordination mode and bridge the copper cations giving rise to 1D polymeric chain, while the 4-pyao ligands co-ordinate *via* pyridine nitrogen atoms (Figure, left). The Cu···Cu separation across the carboxylic group in the polymeric tapes is equal to 9.692 Å. The tapes are associated in the H-bonded network *via* oxime OH-groups and carboxylic oxygen atoms (O(1)-H(1)···O(3)(x+1, y+1, z-1)=2.689(3) Å).





The microstructure and mechanical properties of the compound in study were considered. Tendency to form a hexagonal faceting was observed for the (100) plane. The lateral planes form between them the characteristic angles of 120º. Crystals demonstrated the good mechanical properties. The Young modulus, *E*, and nanohardness, *H* values were typical for such materials [1]. The diminution of the peak load (P_{max}) from 50 mN to 5 mN resulted in increase of these parameters: E=8.99 GPa and 12.12 GPa; H=0.41 GPa and 0.50 GPa for the first and second P_{max}, respectively. This phenomenon is due to the well-known indentation size effect (ISO). Also, it was shown that the contribution of elastic-plastic recovery of material grows with respect to the plastic residual strain. Along with this the next mechanical behaviors were detected, namely, the absence of pop-ins on the P-h curves, the sliding steps and slide curves, the lack of cracks inside the indentations and in its neighbourhood (Figure, right).

[1] Wei L. et al., *Chem. Commun.* **2013**, 49, 4471-4473.