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## New coordination polymer based on $[\text{Ni}(\text{cyclam})]^{2+}$ and octacyanonitobate(IV)

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The combination of  $[\text{Ni}(\text{cyclam})]^{2+}$  (cyclam = 1,4,8,11-tetraazacyclotetradecane) with  $[\text{Nb}(\text{CN})_8]^{4-}$  has been described earlier [1]. The compound exhibits 3D diamond-like network topology and long range magnetic ordering, whose characteristics depend on the amount of crystallisation water. The experiments has shown that after dehydration the original phase cannot be reinstated completely.

We have obtained a new coordination polymer  $\{\text{Li}_2[\text{Ni}(\text{cyclam})]_3[\text{Nb}(\text{CN})_8]_2 \cdot n\text{H}_2\text{O}\}$  in the spontaneous reaction of the above mentioned building blocks in the saturated lithium chloride solution. The compound shows 2D honeycomb-like topology, similarly to  $\{[\text{Ni}(\text{cyclam})]_3[\text{W}_5(\text{CN})_8]_2\}$  network [2]. The porous structure is characterized by channels running across the layers, filled with water molecules and lithium cations, which neutralize the negative charge of the layers. The research shows that there are three phases with different amount of crystallisation water similarly to the previously described 3D network. It also influences the magnetic properties. Fully hydrated sample kept under solvent shows ferrimagnetic ordering with  $T_c = 7$  K. The phase dried in air is a metamagnet with critical field around 1 kOe, while the phase dehydrated under vacuum shows antiferromagnetic characteristics. Magnetic measurements show that the dehydration process is reversible.

References

[1] Beata Nowicka, Maria Bałanda, Mateusz Reczyński, Anna M. Majcher, Marcin Kozieł, Wojciech Nitek, Wiesław Łasocha, Barbara Sieklucka, *Dalton Trans.* 2013, 2616 - 2621.

[2] Beata Nowicka, Michał Rams, Katarzyna Stadnicka, Barbara Sieklucka, *Inorg. Chem.* 2007, 8123 - 8125.

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