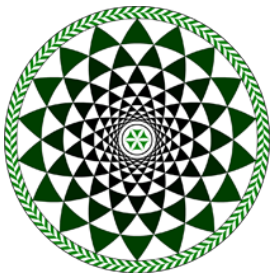

Contribution ID: **26** Type: **poster presentation**

Magnetic properties of new molecular compounds based on single cobalt (II) ion

Tuesday, 4 July 2017 19:10 (2 hours)

Low-dimensional molecular magnets that show slow relaxation of magnetization are of interest because of their possible applications.[1] The smallest among those are Single Ion Magnets.[2] Based on cobalt salt, pyridine and 4-vinylpyridine, two new mononuclear compounds were synthesized: $CoBr_2(py)_2$ and $CoBr_2(4vpy)_2$. The measurements of AC susceptibility at temperatures below 5 K confirmed the occurrence of field-induced relaxation of magnetization for both. Based on Cole-Cole model fits to AC susceptibility vs. frequency, times of relaxation and energy barriers were determined: $CoBr_2(py)_2$ - $\tau_0 = 8 \cdot 10^{-10}$ s, Δ/k_B = 29(4) K, $CoBr_2(4vpy)_2$ - $\tau_0 = 1.4 \cdot 10^{-11}$ s, Δ/k_B = 35(7) K.
The low values of the α parameter (below 0.3 for both compounds) confirmed that the measured compounds are indeed Single Ion Magnets. Despite the low values of τ_0 and Δ/k_B, these compounds are very interesting because of one among the smallest sizes of the molecule (high density of magnetic centers per volume) and the possibilities to use other pyridine-based ligands to obtain other SIM compounds.

This research was financed by the Polish National Science Centre within the SONATA Project UMO-2015/19/D/ST5/01936.

[1] Gatteschi D., Sessoli R., Villain J., *Molecular Nanomagnets*, New York, Oxford University Press, 2006.

[2] Frost J. M., Harriman K. L. M., Murugesu M., The raise of 3-d single-ion magnets in molecular magnetism: towards materials from molecules?, *Chem. Sci.*, **7**, 2470 - 2491, 2016.

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Session Classification: Poster Session

Track Classification: Molecular magnets and nanomagnets