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

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Low-dimensional molecular magnets that show slow relaxation of magnetization are of interest because of their possible applications.<sup>[1]</sup> The smallest among those are Single Ion Magnets.<sup>[2]</sup> Based on cobalt salt, pyridine and 4-vinylpyridine, two new mononuclear compounds were synthesized:  $\text{CoBr}_2(\text{py})_2$  and  $\text{CoBr}_2(4\text{vpy})_2$ . 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:  $\text{CoBr}_2(\text{py})_2$  -  $\tau_0 = 8 \cdot 10^{-10}$  s,  $\Delta/k_B = 29(4)$  K,  $\text{CoBr}_2(4\text{vpy})_2$  -  $\tau_0 = 1.4 \cdot 10^{-11}$  s,  $\Delta/k_B = 35(7)$  K.

The low values of the  $\alpha$  parameter (below 0.3 for both compounds) confirmed that the measured compounds are indeed Single Ion Magnets. Despite the low values of  $\tau_0$  and  $\Delta/k_B$ , 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.

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[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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