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High-pressure neutron scattering of Prussian blue analogue magnets D.M. PAJEROWSKI, S.E. CONKLIN, J. LEAO, National Institute of Standards and Technology Center for Neutron Research — Pressure sensitive magnetism is known to be useful in sensors, and while applications tend to use metallic alloys, molecule based magnets (MBMs) have been shown to have large inverse magnetostrictive (IMS) response. A promising group of MBMs are the Prussian blue analogues (PBAs), in which magnetic ordering can be tuned by external stimuli such as light, electric field, and pressure. Two IMS active PBAs are $KFe_3[Cr(CN)_6]_2$ (Fe-Cr) and $KNi_3[Cr(CN)_6]_2$ (Ni-Cr), and there are open questions about the details of the observed effects. Presently, it is believed that under applied pressure, Fe-Cr undergoes a linkage isomerism (LI) that changes carbon coordination of the CN from Cr to Fe, resulting in a change in magnetic configuration of the Fe cation from high-spin (HS) S = 4 to low-spin (LS) S = 0, thus reducing the observed magnetization. On the other hand, Ni-Cr is thought to undergo random spin-canting due to either bond-deformation or LI. We utilize neutron diffraction to test these theories. Polarized beam experiments are also performed to test a contrary hypothesis of domain wall movement providing the pressure sensitive magnetism.

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