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Magneto-structural study of M(TCNE)(NCMe)]X molecule-based magnets[1] KONSTANTIN POKHODNYA, CHRIS OLSON, CHRIS HETH, North Dakota State University, JOHN SCHLUETER, GREGORY HALDER, Argonne National Laboratory — In M^{II}(TCNE)$(NCMe)_2$]X (M=Fe, Mn, Ni; TCNE = tetracyanoethylene; X = monovalent anion) the magnetic properties can be tuned by systematic altering of transition metal from Mn to Ni, as well as adjusting the inter-plane distances via changing the anion volume (e.g., PF_6, AsF_6 and SbF_6). The magnetic properties of the molecule-based magnets are highly responsive to structural perturbations. For the series of M[TCNE]X magnets the synchrotron-based powder diffraction experiments in combination with magnetic susceptibility, all under hydrostatic pressure, were performed revealing the correlations between metal-ligand bonding and magnetic exchange and allowing the structure-magnetic property correlations to be established. The pathways toward important conductivity and band spin polarization improvements substantial for spin-polarized current injection in microelectronic applications are discussed.

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