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Phase transition tuning by Fe(III)/Co(III) substitution in switchable cyano-bridged perovskites: $(C_3H_5N_2)_2[KFe_xCo_{1-x}(CN)_6]$.

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Streszczenie

The single-crystals of mixed $(C_3H_5N_2)_2[KFe_xCo_{1-x}(CN)_6]$ crystals, with different ratios of x = 0, 0.29, 0.42, 0.51, 0.63, 0.70, 0.85, 1, have been grown from aqueous solutions. The thermal stability of the crystals has been determined using both DTA and TGA analysis. DSC has revealed sequences of structural phase transitions (**PTs**). We have found four solid phases for the crystals with concentrations x < 0.6 and three phases above these concentrations. The Fe(III) concentration has been estimated using the SEM technique. We have found the linear relationship of T_c versus the molar concentration of Fe(III) for the IV → III **PT**. Based on the obtained results, a phase diagram has been constructed. The mechanism of the structural **PTs** has been discussed based on the results of dielectric relaxation, NIR, IR and Raman spectroscopy and X-ray measurements. Dielectric switching has been observed for all analysed mixed-crystals. All crystals exhibit ferroelastic properties.

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