

Electronic structure of hexanitroferrates $K_2M[Fe(NO_2)_6]$ where $M = Pb, Sr, Zn, Ca$

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Detailed variable temperature Mössbauer, infrared, EXAFS spectroscopic measurements and variable temperature magnetic susceptibility experiments were carried out on $K_2PbFe(NO_2)_6$ to investigate the electronic structure and correlate it to the observed unusual magnetic hyperfine interaction in the system. All these results have then been further extended to the other systems where lead has been substituted with strontium, zinc and calcium because of the structural similarity of these systems with the lead compound. This has been further confirmed by detailed variable temperature Mössbauer spectral measurements on the above mentioned systems. The transition temperature in all these systems was found to be 45 K. All these results exactly match the results for $K_2BaFe(NO_2)_6$ reported earlier by the same authors¹ and clearly indicate that the Fe atom in these lattices is in the high spin + 2 oxidation state which is quite contrary to the earlier reports on low spin states.

Reference

1. Padmakumar K and Manoharan P T *Spectrochim. Acta* **A56** 905