Synthesis and magnetic characteristics of new tetrachloroferrates(III) with 2-methylpyridinium, 3-methylpyridinium and 4-methylpyridinium cations: X-ray crystal structure of 4-methylpyridinium tetrachloroferrate(III).

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Streszczenie

The crystal and molecular structure of a new 4-methylpyridinium tetrachloroferrate(III) of molecular formula [4-Me(Py)H][$FeCl_4$] was determined. The iron cation is four coordinated by chlorine anions, and it adopts a slightly distorted tetrahedral coordination with two angles smaller, three equal and one larger than tetrahedral one. The compound is isostructural with its 2- and 3-methylpyridinium analogues. Magnetic measurements of the powdered samples gave negative values of the Weiss constants equal −7.3 K, −6.6 K and −6.2 K for [2-Me(Py)H][$FeCl_4$], [3-Me(Py)H][$FeCl_4$] and [4-Me(Py)H][$FeCl_4$], respectively, which suggest antiferromagnetic coupling. The susceptibility curves of all complexes exhibit maxima indicating the presence of antiferromagnetic ordering with a Neel temperature of approximately 7 K.

Słowa kluczowe

Crystal structure, Magnetic measurements, Tetrachloroferrate(III), 2-Methylpyridinium, 3-Methylpyridinium, 4-Methylpyridinium

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