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## 论文

### 三维亚磷酸铁( $\text{H}_3\text{O}$ ) $_2$ ·[FeII $_5$ (HPO $_3$ ) $_6$ ]的水热合成与结构表征

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#### 摘要:

于中温水热条件下合成出一种三维亚磷酸铁( $\text{H}_3\text{O}$ ) $_2$ ·[FeII $_5$ (HPO $_3$ ) $_6$ ], 并对其进行了单晶解析、热重及磁性等系列表征。晶体属三方(Trigonal)晶系, P3c1空间群, a=1.026 9(5) nm, b=1 026 9(5) nm, c=0.929 5(6) nm, Z=2。化合物中心铁原子采取略变形八面体构型, 与亚磷酸根假四面体连接形成三维骨架结构, 沿c轴方向有一六元环孔道。

关键词: 水热合成; 晶体结构; 亚磷酸铁; 磁性

### Hydrothermal Synthesis and Structures Characterization of a Novel Three-dimensional Iron Phosphite: ( $\text{H}_3\text{O}$ ) $_2$ ·[FeII $_5$ (HPO $_3$ ) $_6$ ]

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#### Abstract:

The replacement of phosphate with phosphite in the transition metal phosphates has attracted more and more research efforts. To date, only a few phosphite materials containing Fe cation have been reported. Our group has developed the hydrothermal synthesis of many novel metal phosphites. Here we reported another three-dimensional iron phosphites ( $\text{H}_3\text{O}$ ) $_2$ ·[FeII $_5$ (HPO $_3$ ) $_6$ ] synthesized under mild hydrothermal conditions and characterized by single crystal X-ray diffraction. The title compound crystallized in the trigonal space group P3c1, with unit cell parameters, a=1.026 9(5) nm, b=1.026 9(5) nm, c=0.929 5(6) nm, and Z=2. The compound formed three-dimensional frameworks with six-membered channels along the c axis. The Fe centers in the frameworks adopt slightly distorted octahedral coordination geometry and were bridged by the pseudo-pyramidal phosphites. The temperature dependence of magnetic susceptibility measurements for the title compound indicates the occurrence of antimagnetic interaction between Fe ions. Neel's temperature for Title compound is 6.43 K. Above Neel's temperature materials have paramagnetic behavior which obeys to Curie-Weiss equation. The Curie constants is 23.4 emu $\cdot$ 5K $^{-1}$ \5mol $^{-1}$ . The effective magnetic moment of the compound at 300 K is 4.25 $\mu$ B per Fe $^{2+}$ .

#### Keywords:

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