

Investigation of thermal behavior of Fe(II,III)-containing borates.

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Fe(II,III)-containing borates exhibit a number of useful properties such as magnetic, magnetoacoustics, resonance and other. However, there is a lack of high-temperature crystal chemical investigations of iron borates in general. There are a few works known devoted to such investigations (Shimomura *et al.*, 2007; Biryukov *et al.*, 2016; Biryukov *et al.*, 2018).

This work reports on the investigation of thermal behavior of Fe(II,III)-containing borates by *in situ* low- and high-temperature X-ray diffraction methods, Mössbauer spectroscopy and thermal analysis. A combination of the methods in the revealing of magnetic phase transitions, investigation of the Fe²⁺ to Fe³⁺ oxidation occur with an increase in temperature using data of these methods showed a good compatibility between each other. Thermal expansion of the borates is described from a viewpoint of crystal chemistry of compounds containing cation- and oxocentred polyhedra.

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