

Magnetic force microscopy and texture analysis by electron-backscatter diffraction on BaTiO₃-(Ni,Zn)Fe₂O₄ multiferroics

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The texture and magnetic characteristics of BaTiO₃-(Ni,Zn)Fe₂O₄ (BT-NZF) multiferroics with various mixing ratios (70:30, 60:40 and 50:50) [1] are investigated by means of electron-backscatter diffraction (EBSD) [2] and magnetic force microscopy (MFM). The EBSD measurements reveal a change in the texture of the ferrite and the BaTiO₃ grains upon increasing the ferrite content in the sample. The 70:30 sample exhibits the best ferrite texture, where only some directions are present. Furthermore, the resulting grain sizes vary from several μm (50:50) to about 100 nm in the 70:30 sample. The MFM images reveal the presence of magnetic domains being extended over several adjacent grains, which according to the EBSD data may comprise different crystallographic orientations. In this way, we can explain the differences in the magnetic contrast obtained.

[1] L. Mitoseriu *et al.*, JMMM **316**, e603 (2007)

[2] A. Koblischka-Veneva *et al.*, IEEE Trans. Magn. **42**, 2873 (2006)