

# STRUCTURE AND MAGNETIC PROPERTIES OF BiFeO<sub>3</sub> BASED COMPOSITES

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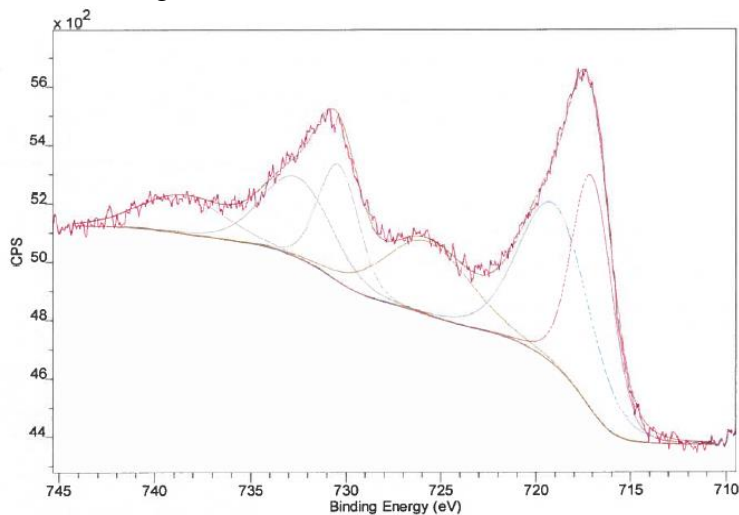
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This work studies the origin of rapid increase of remanent magnetization observed in BiFeO<sub>3</sub>-KBr nanocomposites which have more than 15% of potassium bromide content. Magnetic properties of the composites are caused by magnetically active ferrite phase as pure KBr phase has no magnetic response. Structural measurements performed for the composites using diffraction methods did not reveal any notable change in the crystal structure of the ferrite constituent either a formation of any magnetic impurity phases, while the results obtained by local scale measurements, viz. Raman and X-ray photoemission spectroscopy have detected a notable change in the oxidation state of the iron ions in the ferrite phase. Based on the obtained



**Fig. 1** XPS spectrum obtained for BLFO-KBr (7:3) compound at room temperature.

results (X-ray, Raman spectroscopy, XPS and magnetometry measurements) the authors have concluded about a formation of ferromagnetic-like component which is most probably caused by interactions Fe<sup>2+</sup>/Fe<sup>3+</sup> formed due to a redox reaction occurred in the vicinity of the conjugated phases which causes an increase in the remanent magnetization of the composites. The described model also considers a rotostrictive and magnetostrictive coupling which affect magnetic properties of the composites [1].

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## References

[1] D.V. Karpinsky, O.M. Fesenko, M.V. Silibin et al., Sci. Rep. 9, 10417 (2019).

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