

Experimental report

21/12/2023

Proposal: EASY-1198

Council: 4/2023

Title: Study of the magnetic structure 6H-BaFeO₃

Research area: Materials

This proposal is a new proposal

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Experimental team:

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Samples: BaFeO₃

Instrument	Requested days	Allocated days	From	To
XTREMED	48	48	02/09/2023	04/09/2023

Abstract:

For the resolution of the magnetic structure of the BaFeO₃, the data were measured on the D20 diffractometer with a wavelength of 2.41 Å (proposal number:5-31-2682). However, these data do not allow us to elucidate among the different possible magnetic models which one is the most plausible, nor determine the value of the ordered moment for each iron. In this regard, we request performing a new measurement at 2 K on the XtremD diffractometer with a wavelength of 3.8 Å with the aim of the precisely elucidate the magnetic structure of the 6H-BaFeO₃.

Despite the relatively large works refers to the magnetic structure feature of 6H-BaFeO_{3-x} phase over more than twenty years, this remains unsolved nowadays. For this purpose, neutron diffraction data were measured on the D20 diffractometer with a wavelength of 2.41 Å (proposal number:5-31-2682). However, these data do not allow us to elucidate among the different possible magnetic models which one is the most plausible, nor determine the value of the ordered moment for each iron.

In this regard, we collected a new data on the XtremD diffractometer with a wavelength of 3.8 Å. The figure 1 shows the neutron diffraction at 10 K. The analysis of the data are in progress and will allow to elucidate a plausible magnetic structure for the first time of the 6H-BaFeO_{2.96}.

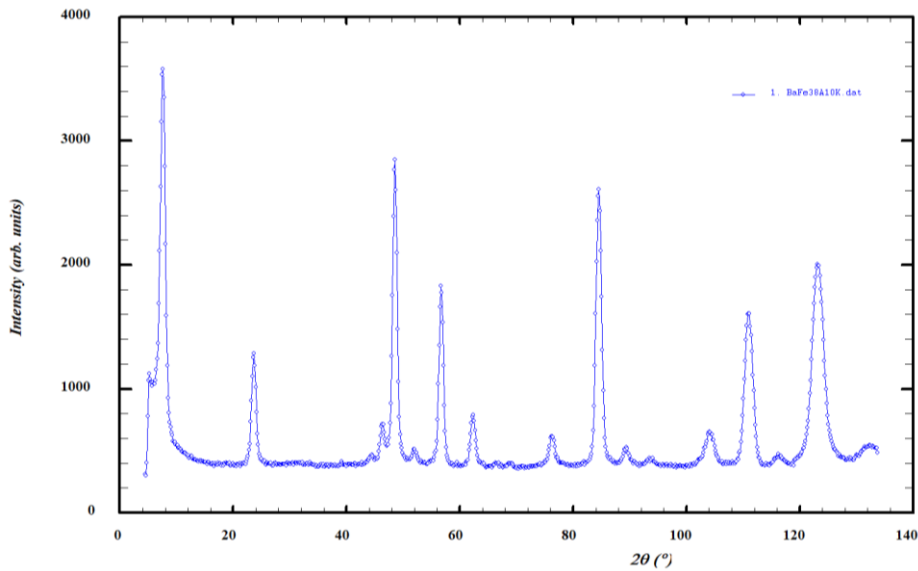


Figure 1. Neutron diffraction patterns at 10 K of the BaFeO_{2.96}.