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EBSD analysis of MgB₂ bulk superconductors

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The grain orientation, the texture and the grain boundary misorientations are important parameters for the understanding of the magnetic properties of the bulk MgB₂ samples intended for super-magnet applications. Such data can be provided by electron backscatter diffraction (EBSD) analysis. However, as the grain size of the MgB₂ bulks is preferably in the 100-200 nm range, the common EBSD technique working in reflection works only properly on highly dense samples. In order to achieve a reasonably good Kikuchi pattern quality on all samples, we apply here the newly developed transmission EBSD (t-EBSD) technique [1] to MgB₂. This method requires the preparation of TEM slices by means of focused ion-beam milling, which are then analyzed within the SEM, operating with a specific sample holder. We present several EBSD mappings of samples prepared with different techniques and at various reaction temperatures.

[1] P. W. Trimby, Ultramicroscopy 120, 16 (2012)

The following information is mandatory but will not appear in the abstract book.

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