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Abstract Guidelines

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MICROCHARACTERISATION OF GRAIN ORIENTED CERAMICS BASED ON Bi_3TiNbO_9 OBTAINED FROM MECHANOCHEMICALLY ACTIVATED PRECURSORS

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Piezoelectric properties of conventionally sintered Aurivillius ceramics, like those based on Bi_3TiNbO_9, are not usually significantly large due to the restrictions of the spontaneous polarisation to two dimensions (a-b plane), as compared to the three dimensional freedom of normal perovskites. In order to solve this problem several alternative fabrication processes can be applied, among them hot pressing, which in this occasion is applied to a novel powder synthesised by mechanochemical activation of the starting oxides.

Control of the degree of orientation achieved is carried out by quantitative texture analysis of experimental X-ray pole figures. Although texture could be considered the most influencing factor in the final properties, other microstructural features are also studied, such as grain boundaries and ferroelectric domains. Transmission Electron Microscopy reveals the presence or absence of precipitates between grains, and the characteristics of the ferroelectric domain configuration, which has not been extensively studied in this family of compositions.

Results of the microcharacterisation of these ceramics are finally discussed in view of the improved final properties of the grain oriented ceramics studied.