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Structural and Dielectric Characterization of SrBi₂Ta₂O₉ Doped with Gadolinium JORGE MATA, ALEJANDRO DURAN, RAUL ESCAMILLA*, EDUARDO MARTINEZ, JESUS SIQUEIROS, Centro de Ciencias de la Materia Condensada, UNAM. Apdo. Postal 2681, Ensenada, B.C., Mexico.*IIM-UNAM, Apartado Postal 70-360, Mexico, D. F. 04510. — The results of the study of polycrystalline samples of SrBi₂Ta₂O₉ (SBT) doped with Gd, Sr-vacancies and a Bi-excess are presented. XRD structural characterization using Rietveld refinement revealed that the Gd-doped SBT with Sr-vacancies and Bi-excess (Sr_{0.70}?_{0.15}Gd_{0.15}Bi₂Ta₂O₉) is single phase. Furthermore, cationic disorder on the Bi³⁺ and Sr²⁺ crystallographic sites is promoted by the addition of the Gd³⁺ ions. Replacement of Gd ions for Sr and vacancies in the SBT structure produces a shift toward lower values of the Curie Temperature (T_c) from 400 to 200 °C in contrast with previous reports in the literature where a notable increase in T_c and the dielectric permittivity are found when the Sr- site is replaced with vacancies. Bi and Gd substitution and the cation vacancies at the Sr site in the Sr_{0.70}?_{0.15}Gd_{0.15}Bi₂Ta₂O₉ compound, enhance the structural distortion in the TaO₆ octahedra and leads to a larger ferroelectric spontaneous polarization. Acknowledgments: This work was partially supported by DGAPA-UNAM Project N° IN100903 and CONACYT No. 47714-F and 40604-F. The authors thank Pedro Casillas, M. Sainz, J. Peralta for their technical assistance.

Jorge Mata
Centro de Ciencias de la Materia Condensada

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