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X-ray diffraction study of amorphous lithium disilicate glass processed under high pressure ALTAIR SORIA PEREIRA, SILVIO BUCHNER, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil, JOAO CARDOSO DE LIMA, Universidade Federal de Santa Catarina, Florianopolis, SC, Brazil, NAIRA MARIA BALZARETTI, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil — Lithium disilicate glass ($\text{Li}_2\text{O}\cdot 2\text{SiO}_2$) is a very interesting vitreous material, because, besides several important technological applications (e.g. biomaterial to produce prostheses and implants), shows a large difference between the T_g and T_c values. This is important for the investigation of the crystallization mechanism on vitreous phases, as it allows the independent study of the nucleation and growth stages. In this work, we have investigated the effect of high-pressure processing in the induction of structural changes in the amorphous phase. This can give place to polyamorphism and/or to the generation of possible seeds for a crystalline phase nucleation. Using toroidal type high-pressure chambers, glass samples were processed at 2.5 GPa, 4 GPa, 6 GPa and 7.7 GPa at room temperature. Synchrotron X-ray diffraction was used to obtain the radial distribution functions (RDF), in order to follow the structural changes at different ranges. Compared to a pristine sample, the main change observed for the samples processed up to 6 GPa was associated to the distortion of the SiO_4 tetrahedra, as already observed in the literature. However, for the sample processed at 7.7 GPa, we have identified a drastic change in the RDF which points for the production of a different amorphous phase with a local structure closer to that observed for the Li_2SiO_3 crystalline phase.

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