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Abstract zum Post

**Efficient Hot-Press sintering synthesis as alternative technology for
high temperature melting glass: $\text{La}_2\text{O}_3\text{-Al}_2\text{O}_3\text{-SiO}_2$**

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Hot-Press (HP) sintering glass from powders is an efficient technology to produce glass samples of special shapes, such as preforms for optical fibers, compared to the traditional crucible melting technology. HP sintering technology can lower the costs and can simplify the machining and forming processes for preparation of fiber preforms (e.g. casting, rounding, polishing) in order to achieve higher efficiency in the production of glass components. Applying high pressure in glass sintering processes has positive effects by increasing the refractive index, homogeneity and by decreasing the temperature required for glass forming. In this way one could stay below the temperature limit of 1650°C for the melting of fritted glass in platinum crucibles. In our study the preparation of specific $\text{La}_2\text{O}_3\text{-Al}_2\text{O}_3\text{-SiO}_2$ glasses for optical fibers by HP sintering has been investigated. Glass powders have been sintered into cylindrical shape with 25 mm in diameter and a height of 10 mm in a temperature range near the glass transition temperature of 820°C and at a pressure of 60 MPa applied in a graphite "Piston-Cylinder" system. The influence of the different preparation paths – HP and traditional crucible melting – on the optical and thermal properties of the resulting glasses has been investigated. The characterization methods included measuring of the refractive index, UV- and IR-absorption, glass transition temperature, softening point and thermal expansion coefficient.