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Seção
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Physical properties of Sb2 O3 - P2 O5 glasses

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Resumo

Some physical properties of a Sb2 O3 -P2 O5 glass were analyzed. A glass with composition (mol%) 75Sb2 O3 25P2 O5 were melted in an electrical furnace and in glassy carbon crucible at 1000 . Samples were cutted, lapped and polished with cerium oxide and using ethylene glycol as polishing fluid, since the glass presents some hygroscopicity. Using the Archimedes principle and ethylene glycol again as immersion fluid, the density of the glass was determined to be ρ= (4,774±0,001) g/cm^3. The pulse-echo method was applied to determine the longitudinal and transversal ultrasonic velocities. These values enable the calculation of the Young modulus, E, and the Poisson coefficient, ν: E = (39±2) GPa and ν = 0,22±0,01. The experimental value of the hardness was obtained from measurements of the Vickers impression diagonals, d, produced by applying loads, P , up to 500 g: H = (2,31±0,04) GPa. Dilatometric measurements indicate that the glass transition temperature, Tg, is about 300 , and the dilatometric softening temperature, Td, is 330 . The coefficient of thermal expansion, α, between 150 and 270 is 17.3 x 10−6 °−1 . Once the glass is transparent, the refractive index was obtained by using an optical microscope. This values is roughly given: n = (1,96±0,08). Therefore one can conclude that, although the low values of the Young modulus and hardness, the high value of the refractive index demonstrates that this glass can present interesting optical applications.