**Birefringence of nanoporous alumina: Dependence on structure parameters**

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Abstract. We report on experimental and theoretical investigations of the birefringence of free-standing nanoporous anodic alumina membranes in the optical range. The value of birefringence is analyzed for the samples with different porosities by measuring polarization dependent transmission spectra at different angles of incidence. The experimental data are compared to the results of birefringence simulations in accordance with the modified Bruggeman effective-medium approximation. It is both experimentally and theoretically shown that the birefringence value increases with porosity increases in the low porosity region. The porous alumina samples under investigation possess the greatest value of birefringence (0.062) up to the present.

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