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Attempts to grow β -BaB₂O₄ (β -BBO) crystal fibers by the micro-pulling down technique. Characterization by Raman micro-spectroscopy

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Barium metaborate (β -BaB₂O₄ or β -BBO) is known to be an excellent nonlinear optical material with a wide transmission range 190–3500 nm and a high damage threshold (10 GW.cm⁻²). BaB₂O₄ has two modifications : the low temperature b phase and the high temperature a phase with a centrosymmetric crystal structure which has no utility in second order harmonic generation. In early works, the β -BaB₂O₄ crystals were grown below the a-b transition temperature (T~920°C) by using flux methods leading to crystals exhibiting more or less inclusions detrimental to their properties. More recently, the successful growth of high quality β -BaB₂O₄ without any flux from a supercooled BaB₂O₄ composition melt was reported [1-3].

The aim of this talk is to present the results presently obtained on the growth of β -BBO crystal fibers directly from the melt without any flux. To investigate their behaviour during pulling, the crystals obtained were thoroughly characterized by Raman micro-spectroscopy.

References

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