Growth and Crystal Structure of Bismuth Octaborate, α-$Bi_2B_8O_{15}$

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The objects of this search were a study of $Bi_2B_8O_{15}$ crystallization in the melts of near stoichiometric compositions, a determination of bismuth octaborate solid solutions range and a refinement of crystal structure of low-temperature phase of bismuth octaborate, α-$Bi_2B_8O_{15}$.

The bismuth octaborate crystals were grown from the melts of stoichiometric (20mole% Bi_2O_3 /80 mole% B_2O_3) and near stoichiometric (21.9mole% Bi_2O_3 / 78.1mole% B_2O_3) compositions. The grown crystals of a plate like form were of (5-7) mm in thickness, 27 x 27 mm^2 in cross-section. Comparison of lattice parameters of grown α-$Bi_2B_8O_{15}$ crystals (a=4.3191(9), b=22.175(7), c=6.4739(19)Å, β=105.44(2)°, sp.gr. $P2_1$, z=2) with the data presented in [1, 2] indicates that the phase of non-stoichiometric, Bi_2O_3-rich, composition exists unlike to the α-$Bi_2B_8O_{15}$ phase studied by authors of [1, 2]. Structure was refined as a racemic twin with components 0.80 and 0.20. Range of solid solutions having the 78.1mol.% B_2O_3 – 84.7mol.% B_2O_3 boundaries exists for the $Bi_2O_3 \cdot 4B_2O_3$ compound.

[1] Teng B., Yu W. T., Wang J. Y., Cheng W. F., Dong S. M., Liu Y. G., *Acta Cryst,* 2002, **C58**, i25. [2] Egoryusheva A.V., Kanisheva A.S., Kargin Yu. F., Gorbuova Yu. E., Mikchailov Yu. N., *Journ. Inorganic Chemistry,* 2002, **47**. 1961.

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