

Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

Melting of GaN – still open problem S. POROWSKI, B. SADOVYI, S. GIERLOTKA, A. PRESZ, I. GRZEGORY, Institute of High Pressure Physics PAS, Sokolowska str., 29/37, 01-142 Warsaw, Poland, I. PETRUSHA, V. TURKEVICH, D. STATIICHUK, Dep. of Synthesis and Sintering of Superhard Materials, V. N. Bakul Institute for Superhard Materials NAS Ukraine, Avtozavodska str., 2, Kyiv, 04074, INSTITUTE OF HIGH PRESSURE PHYSICS PAS, SOKOLOWSKA STR., 29/37, 01-142 WARSAW, POLAND TEAM, V. N. BAKUL INSTITUTE FOR SUPERHARD MATERIALS NAS UKRAINE, AVTOZAVODSKA STR., 2, KYIV, 04074, UKRAIN TEAM — In this work, thermal stability of GaN single crystals at pressure up to 9.0 GPa and temperature up to 3400 K has been studied. According to [1] the congruent melting of GaN occurs at 2533 K at pressure above 6.0 GPa. Results obtained in our study are not in agreement with this observation. In whole pressure and temperature range we observed that GaN decomposes to N₂ gas and liquid gallium solution of nitrogen. The p-T decomposition curve which has been established is consistent with previously reported data for lower pressures and temperatures [2]. Also corresponding solubility of nitrogen in the liquid gallium has been evaluated by measuring the weight of crystals grown from solution at cooling of the system. At the highest pressure 17 at. % solubility was observed which is still significantly lower than 50 at. % required for stoichiometric melt.

[1] W. Utsumi et al. *Nature Materials* **2**, 735 (2003).

[2] J. Karpiński et al. *J. Crystl Growth* **66**, 1 (1984).

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Date submitted: 25 Feb 2013

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