Abstract Submitted for the SHOCK07 Meeting of The American Physical Society

Hugoniot and phase transition in silicon nitride porous samples.<sup>1</sup> VLADISLAV YAKUSHEV, ALEXANDER UTKIN, ANDREY ZHUKOV, Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia — In this work by laser interferometer VISAR investigated the behavior of silicon nitride porous samples with porosity of ~ 15% in high pressure shock waves in the region of 15 – 50 GPa. Hugoniot was constructed. The interest to the high density c – modification mainly caused by its hardness, close to hardness of cubic boron nitride and diamond. In this work we investigate the phase transition from  $\beta$  - Si<sub>3</sub>N<sub>4</sub> to c- Si<sub>3</sub>N<sub>4</sub> in porous samples by laser interferometer method for sample surface velocity registration. This method allows to obtain with high resolution mass velocity profiles of sample material at shock compression. The analysis of structure of such profiles gives the information about phase transition and its kinetics. Also by results of experiments Hugoniot is constructed. Having Hugoniots at different porosities allows to construct equation of state with maximal accuracy, which define the phase balance curve, in this case, balance between  $\beta$  - and c – phases.

<sup>1</sup>The work was supported by RFBR, grant number 06-03-33138, and Russian Science Support Foundation.

Vladislav Yakushev

Date submitted: 19 Feb 2007

Electronic form version 1.4