

Abstract Submitted  
for the SHOCK05 Meeting of  
The American Physical Society

**Peculiarities of biotite, quartz and garnet transformations in conditions of step-like shock compression of crystal slate** ANDREY ZHUK, VLADIMIR MILYAVSKIY, TATIANA BORODINA, SERGEY SOKOLOV, Institute for High Energy Densities RAS, VILEN FEL'DMAN, LUDMILA SAZONOVA, Department of Petrology of Moscow State University — A character of shock metamorphism of the crystal slate, which consists of a garnet, plagioclase, biotite and quartz has been studied with use of recovery assemblies of planar geometry. In the specimens, maximal shock pressures were reached after several reverberations of the waves between the walls of the recovery ampoule and were ranged from 19 to 52 GPa. In biotite, the mechanical deformations (fractures and kink bands of various crystallographic orientation) in the whole range of pressures were observed. The melt of biotite begins from  $\sim 30$  GPa along fractures and on contacts with other minerals. At shock pressure 52 GPa about 70% of biotite grains transform to glass. From biotite melt formed at 52 GPa, after pressure and temperature drop crystallization of new phases begins. One of them corresponds to alumina ringwoodite ( $\text{Al}_2\text{O}_3$  content up to 16%). The composition of the second phase is essentially close to that of grossular garnet. Shock-induced transformations of quartz and garnet were studied in the present work, too. The results of experiments were compared to the literature data and natural metamorphism of rocks in impact craters.

Andrey Zhuk  
Institute for High Energy Densities RAS

Date submitted: 08 Apr 2005

Electronic form version 1.4