The possibility of formation of new carbon phases from graphite at continuous exposure under pressures of 18 GPa to 45 GPa at room temperature was examined. Measurements were carried out in the diamond anvil cell (DAC) with electrically conductive anvils of the ”rounded cone-plane” type made of synthetic polycrystalline diamonds ”carbonado”. The resistance measurements were carried out step by step in cycles of loading-unloading at pressure range from 18 GPa to 45 GPa. The exposure time at each fixed value of pressure was twenty four hours. The features in the pressure dependence of resistance as well as its relaxation times were found in the range 27–35 GPa. These features were referred to new phase nucleation.

After pressure treatment, the samples were examined by means of the workstation AURIGA CrossBeam, which is a scanning electron microscope with the possibility of X-ray microanalysis. The X-ray image of the sample subjected to the pressure of 45 GPa shows the inclusion of a new phase, which did not disappear after removal of the load. However, the new phase is poorly seen in the pressure dependence of resistivity because of shunting by a large amount of non-transformed graphite. This work was supported by the Government of the Sverdlovsk district and RFBR (grant 13-02-96039-r_ural).