

Abstract Submitted
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Nonmonotonic conductivity change of C₆₀ fullerene crystals under dynamic compression up to 300 kbar VLADIMIR V. AVDONIN, V.I. POSTNOV, D.V. SHAKHRAY, K.L. KAGAN, A.F. SHESTAKOV, V.E. FORTOV¹, Institute of Problem of Chemical Physics RAS, V.V. KVEDER, R.K. NIKOLAEV, N.S. SIDOROV, Y.A. OSSIPYAN², Institute of Solid State Physics RAS — In the present work the conductivity of fullerene C₆₀ crystals has been measured under smooth shock wave quasi-isentropic loading conditions up to 30 GPa at initial temperature T=293 K. Not monotone behavior of conductivity has been revealed under compression of crystal with pressure increasing: -at first conductivity grows by many orders then it falls very fast. Conductivity increasing is explained by decreasing of bandgap of C₆₀ under compression whereas conductivity decreasing can be explained on the assumption that the energy barrier of polymerization of C₆₀ reduces with pressure increasing approximately in the same measure as band-gap energy. Research is financially supported by the Russian foundation for basic research, the grant N 03-02-16322, the grant of the President of Russia NS 1938.2003.2, and program of basic researches of the Russian Academy of Science “Thermophysics and mechanics of processes at high energy densities.”

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