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Properties of high density gaseous nitrogen under shock compression in hemispherical geometry MIKHAIL ZHERNOKLETOV, SERGEI KIRSHANOV, ALEXEI KOVALEV, ALEXANDER MEZHEVOV, MIKHAIL NOVIKOV, RFNC-VNIIEF — Recent investigations of liquid nitrogen properties under shock compression show compression limit of 4.2 close to of ideal gas $\sigma = 4$ in pressure region 100 – 330 GPa and demonstrate an unusual Hugoniot pressure – density dependence similar to isochoric compression. We performed two experiments with gaseous nitrogen with initial density $\rho_0 = 0.8$ g/cm^3 to confirm previous data on liquid nitrogen. The experiments were conducted using HE shock wave generators of hemispherical geometry. We obtain Hugoniot pressures (190 ± 5) and (226 ± 5) GPa, compressions (4,64 ± 0,47) and (4,42 ± 0,36), temperatures (37500 ± 5800) and (45900 ± 9300) K. Experimental data on gaseous nitrogen agree with that on liquid nitrogen and modified model of compressible covolume.

Mikhail Novikov
RFNC-VNIIEF

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