

Abstract Submitted
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Experimental Study of Transition of Jupiter and Saturn Atmosphere to Conducting State¹ V. YA. TERNOVOI, S.V. KVITOV, D.N. NIKOLAEV, A.A. PYALLING, A.S. FILIMONOV, V.E. FORTOV, Department of Extreme States of Matter, Institute of Problems of Chemical Physics RAS, Chernogolovka, 142432 Moscow Region, Russia — A modified equation of state of helium-hydrogen mixtures was used for 1D hydrodynamic simulation of performed experiments with multiple shock compression of Jupiter and Saturn model atmospheres. That permitted us to obtain the isentropic compression at third and later steps of compression in the pressure region 20 -150 GPa. It was shown that the helium-hydrogen mixtures become conductive due to appearance of hydrogen conductance. The intervals of pressure - temperature - density states of these transitions are 27-36 GPa - 4400-5000 K - 0.36-0.41 g/cc for Jupiter and 50-70 GPa - 3100-3300 K - 0.5-0.57 g/cc for Saturn in accordance with our new and previous experiments with the pure hydrogen and gas mixtures.

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Vladimir Ternovoi
Department of Extreme States of Matter
Institute of Problems of Chemical Physics RAS
Chernogolovka, 142432 Moscow Region, Russia

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