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Electronic phase transitions in XeF_2 under extreme pressures MATHEW DEBESSAI, MINSEOB KIM, Institute for Shock Physics, CHOONG-SHIK YOO, Institute for Shock Physics and Department of Chemistry — The application of high external pressure decreases the interatomic/molecular distance of solid in a substantial way, and often gives rises to novel transitions and properties such as insulator-metal transition, superconductivity, and magnetism. Fluorine is one of few materials that have not been metalized, presumably because of the formidably high transition pressure. Yet, it has been suggested that the formation of molecular compounds may drop the transition pressure as recently found in hydrogen-rich group IV systems such as CH_4 and SiH_4. In this paper, we present the experimental evidence that XeF_2 indeed metalizes at the pressure well below the metallization pressures of Xe (124 GPa) or F_2 (predicted to be above 500 GPa) and thereby confirms the concept of a chemically precompressed state.

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