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Spectroscopic evidence for pressure-induced metallization in solid silane[1] XIAO-JIA CHEN, VIKTOR V. STRUZHKIN, ALEXANDER GONCHAROV, YANG SONG, ZHEN-XIAN LIU, HO-KWANG MAO, RUSSELL J. HEMLEY, Geophysical Laboratory, Carnegie Institution of Washington, Washington, DC 20015 — Infrared reflectance measurements on solid silane SiH_4 have been performed under pressure up to 70 GPa at room temperature. After passing through three phase transformations, solid SiH_4 is already black at 30 GPa. At high pressures around 60 GPa, the infrared reflectance spectra exhibit a Drude metallic behavior, signaling the pressure-induced metallization in solid silane. Angle-dispersive powder x-ray diffraction studies reveal that a structural transition is accompanying the silane transition to the metallic state.

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Xiao-Jia Chen
Geophysical Laboratory, Carnegie Institution of Washington,
Washington, DC 20015

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