

Abstract Submitted
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Superconductivity in Sc, Y, Lu, and CaLi₂ under Extreme Pressures¹ M. DEBESSAI, J.J. HAMLIN, A.K. GANGOPADHYAY, J.S. SCHILLING, Dept. Physics, Washington U, St. Louis, MO, USA, T. MATSUOKA, K. SHIMIZU, KYOKUGEN, Osaka U, Japan — Following the first experiments by Sizo and Onnes in 1925 on Sn, studies of superconductivity under high pressures have made important contributions by furthering our understanding of this exotic state and creating many new and novel superconducting materials, including O, Si, Fe, I, and Cs. Indeed, the number of elemental superconductors across the periodic table has almost doubled through the application of extreme pressures. MgB₂ exhibits the highest value of T_c of any known binary compound, but the T_c values of elemental superconductors under extreme pressures are not far behind. We have recently used pressures as high as nearly 2 Mbar to induce superconductivity in Sc, Y, and Lu, as well as to search for superconductivity in CaLi₂. T_c values as high as 20 K are obtained, comparable to the highest values observed for the A15 compounds. These studies thus allow an investigation into the question: what is the maximum possible value of T_c in a phonon-mediated superconductor?

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