

High Pressure Amorphization of Bi_4I_4 – Bi^+ Formation and Superconductivity

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February 22, 2017

Abstract

The recent demonstration of high pressure superconductivity in the exotic topological insulator Bi_4I_4 ,^{1,2} through a presumed amorphization process, can be understood as the formation of an irregular lattice of monovalent bismuth ions - Bi^+ , and their predicted electronic Bose-Einstein condensation of bosons.³ An obvious prediction derived from this scenario is a density dependent critical transition temperature.

Introduction

The simple binary compound system 'bismuth iodide' resides in an absolutely unique position within the periodic table of the elements. Both bismuth and iodine are naturally mononuclidic. Iodine is the heaviest halide, and bismuth is the heaviest non-radioactive metal and the heaviest group V element, and even as a semimetal, it remains the only purely metallic group V element in the group V column.

References

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