

Accepted Manuscript

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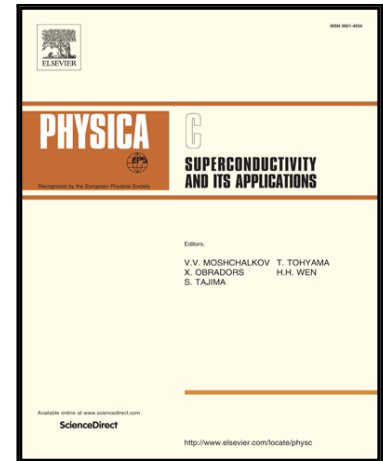
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PII: S0921-4534(18)30211-9
DOI: [10.1016/j.physc.2018.05.012](https://doi.org/10.1016/j.physc.2018.05.012)
Reference: PHYSC 1253359

To appear in: *Physica C: Superconductivity and its applications*

Accepted date: 7 March 2018

Please cite this article as: Katsuya Shimizu , Superconducting elements under high pressure, *Physica C: Superconductivity and its applications* (2018), doi: [10.1016/j.physc.2018.05.012](https://doi.org/10.1016/j.physc.2018.05.012)



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Superconducting elements under high pressure

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abstract

Developing room-temperature superconductor (superconducting at temperature higher than room temperature) is one of our goals of science and technology. Pressure is a powerful tool for investigation of superconductor to improve the properties and to synthesize the target material. Most of superconducting materials show a negative pressure dependence in the superconducting temperature, T_c . But some elements show the positive dependence at high pressure. We have been interested not only in the pressure effect on T_c but also in the onset of new superconductivity under pressures. Here we review the experimental investigations of pressure-induced superconductivity in elements with developments of high-pressure technique combined with low-temperature equipments.

Keywords: pressure, element, superconductivity, diamond anvil cell

1. Introduction

What metal superconduct at low temperature? It remains incompletely understood and the mechanism of appearance of superconductivity is still unclear. A kind of treasure hunting; searching for material showing high-transition temperature, T_c had been started after the discovery of superconductivity in Hg (mercury) at 1911. Possibility of selection and formation of element is infinite. To explore the possibility of elements or compound, pressure is one of the most effective and powerful tools. For example, pressure can change the atomic distance and electric structure, then non-superconducting material could turn into superconducting or the existing T_c increases. In fact, the current highest T_c of elements is recorded around 29 K under

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