# Characterization of novel high-pressure close-packed superconducting phase of boron

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We report study on the thermodynamic properties of the novel high-pressure superconducting phase of boron with hexagonal $P6_3/mcm$ structure [1]. Our analysis is conducted at the pressure of $p = 400$ GPa, what is motivated by the highest value of the superconducting transition temperature ($T_C$) observed previously under such conditions for the $P6_3/mcm$ boron. Our investigations of the thermodynamic properties are performed within the Eliashberg formalism, due to the strong-coupling character of the considered material. In particular, we calculate the thermodynamic properties of the superconducting state which allows us to determine the values of the characteristic dimensionless parameters; the zero-temperature energy gap to the critical temperature, the ratio of the specific heats, as well as the ratio connected with the zero-temperature thermodynamic critical field.

**References:**

[1] D. Li, K. Bao, F. Tian, X. Jin, D. Duan, Z. He, B. Liu and Tian Cui, RSC Adv. 4, 203 (2014).