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M2Po2A-04 [28]: Analysis of superconductivity properties of $\text{PbH}_4(\text{H}_2)_2$ calculated by using an Eliashberg equations

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Our research was focused on $\text{PbH}_4(\text{H}_2)_2$ which is the first of plumbanes homologous serie dopped by a hydrogen. Superconducting state in a homologous series wasn't checked yet. This is a very interesting issue against of Ashcroft's thesis about superconductivity in hydrogen rich compounds. This compound connects the heavy element like lead and the lightest -hydrogen. If the properties were calculated by us in the future for last two elements of plumbans homologous serie it

could show what is the dependence between the quantity of lead and hydrogen atoms. The research was aimed to determine the superconducting properties of the compound $\text{PbH}_4(\text{H}_2)_2$. Critical temperature value (T_c) which the compound $\text{PbH}_4(\text{H}_2)_2$ under the pressure 200 GPa goes into a superconducting state in a function of Coulomb pseudopotential was calculated by using the formalism of Eliashberg equations due to the high value of electron-phonon coupling constant in the studied system ($\lambda = 1.3$). It was found that for the Coulomb pseudopotential value $\mu^* \in (0.1, 0.3)$ the critical temperature is within the range 81 K to 121 K. We also calculated normal heat and heat of the superconducting state in this compound. As part of the work, the full order parameter was also determined and the value of the dimensionless coefficient R_Δ , which is 3.96 to 4.22.

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