

Abstract Submitted
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Superconductivity of Alkali Metals under High Pressure LEI SHI, DIMITRIOS PAPACONSTANTOPOULOS, School of Computational Sciences, George Mason University — We calculated the superconductivity properties of alkali metals under high pressure using the results of band theory and the rigid-muffin theory of Gaspari and Gyorffy. Our results suggest that at high pressures Lithium, Potassium, Rubidium and Cesium would be superconductors with transition temperatures approaching 10-20 K. Our calculations also show that Sodium would not be a superconductor under high pressure even if compressed to less than half of its equilibrium volume. We found that the compression of the lattice strengthens the electron-phonon coupling through a delicately balanced increase of both the electronic and phononic components of this coupling. This increase of the electron-phonon coupling in Li is due to an enhancement of the s-p channel of the interaction, while in the heavier elements the p-d channel is the dominant component.

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