

## Impact of eigenvalues on the electron-phonon coupling strength of magnesium and its binary alloys

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**Abstract.** Magnesium is a highly reactive alkaline earth metal. In the present work we have dealt with the impact of eigenvalues on the superconducting state parameter viz. the electron-phonon coupling strength ( $\lambda$ ) of this metal. Side by side two binary alloys of it viz. magnesium-aluminium and magnesium-indium have also been considered for the same. In this course the form factors for all of them have been computed. For the purpose of this initially the orthogonalised plane wave parameter has been taken as unity. Then the Vashishta-Singwi form of exchange and correlation is employed. Finally the results have been compared with the theoretical values derived by others. Our computation reveals that  $\lambda$  can be reasonably reproduced by the Harrison's first principle pseudopotential technique provided a proper choice of the core energy eigenvalue is made.

**Keywords.** Superconducting state parameter, Orthogonalised plane wave parameter, Eigenvalue, Form factor, Correlation.

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