

Electron affinities of alkaline-earth-metal atoms

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The negative ions of the alkaline-earth-metal atoms (Be to Ba) have been studied by means of a pseudopotential model together with configuration- interaction and multiconfiguration self-consistent-field techniques. Only the heavier ions Sr⁻ and Ba⁻ have been predicted to be stable. For Ca atoms the situation is very complicated, and our calculations do not permit us to decide whether the negative ion is stable with respect to the neutral atom or not. The calculated electron affinities are very small and depend strongly on the correlation energy. It has been found that the core-valence correlation contribution to the electron affinities is important and reduces their values significantly. © 1990 The American Physical Society.