

# Turkish Journal of Physics

Turkish Journal

of


Physics

Energetics of Spherical Clusters

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**Abstract:** The energetics of spherical clusters of elements Fe in bcc, Ca and Pb in fcc, and C in diamond structure have been investigated by using empirical many-body potential energy function which contains two- and three-body interactions. In the variation of average interaction energy per atom ( $E_b$ ) versus cluster size ( $N_{sh}$ ; number of shells) only carbon clusters have magic numbers at 5, 8, 11 and 14 shells.  $E_b$  versus  $N_{sh}$  becomes smooth after 15 shells for carbon, however this variation becomes smooth for the other elements after 10 shells. The variation of two-body to three-body interaction energy versus cluster size becomes almost constant after 10 shells for all elements considered. Energetic cluster size effect has been also investigated for the elements considered.

 [Keywords](#)  
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Turk. J. Phys., **23**, (1999), 517-524.

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