

## Formation Mechanism and Binding Energy for Equilateral Triangle Structure of $\text{He}_3^+$ Cluster

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**Abstract:** The formation mechanism for the equilateral triangle structure of the  $\text{He}_3^+$  cluster is proposed. The curve of the total energy versus the internuclear distance  $R$  for this structure has been calculated by the method of a modified arrangement channel quantum mechanics. The result shows that the curve has a minimal  $-7.81373$  a.u at  $R=1.55a_0$ . The binding energy of  $\text{He}_3^+$  with respect to  $\text{He}+\text{He}^++\text{He}$  was calculated to be  $0.1064$  a.u. (about  $2.89$  eV). This means that the  $\text{He}_3^+$  cluster may be formed in the equilateral triangle structure stably by the interaction of  $\text{He}^+$  with two helium atoms.

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Key words:  $\text{He}_3^+$  cluster, binding energy, equilateral triangle structure

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