

## STUDY OF ALPHA CLUSTER STRUCTURES IN THE $^{46}\text{Ti}$ NUCLEUS

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We present the results of experimental and theoretical studies on the role of clustering on the structure of excited states of  $^{46}\text{Ti}$ . The  $^{46}\text{Ti}$  nuclei were produced in a  $^{45}\text{Sc}(^3\text{He}, d)^{46}\text{Ti}$  proton pickup reaction at a bombarding energy of 30 MeV [1]. Excited levels of  $^{46}\text{Ti}$  were observed in a wide energy range from 2 to 16.5 MeV. Levels from 10.4 to 16.5 MeV were observed for the first time and populated with a high probability. Calculations within the framework of the dinuclear system model [2] showed that the population of states with energies  $Ex \geq 10$  MeV in  $^{46}\text{Ti}$  as well as their structure can be explained by the formation of the  $^{42}\text{Ca}+^4\text{He}$  alpha cluster system, corresponding to the superdeformed state of  $^{46}\text{Ti}$ . The structure of alpha-cluster states in the  $^{44-52}\text{Ti}$  isotopic chain has been analyzed. The results are compared with experimental data on the formation of alpha-cluster binary systems in  $^{44,46,52}\text{Ti}$ , obtained previously in the reactions  $^{40,42,48}\text{Ca}(^7\text{Li}, t\alpha)^{40,42,48}\text{Ca}$  [3].

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3. Fukada M., Takimoto M. K., Ogino K., Ohkubo S.  $\alpha$  Cluster States in  $^{44,46,52}\text{Ti}$  // *Phys. Rev. C*. 2009. V. 80. P. 064613.