Contribution ID: **333** Type: **Oral talk (15 min + 5 min questions)**

STUDY OF EXCITED STATES IN ATOMIC NUCLEI 46Ti AND 45Ti IN REACTIONS WITH 3He BEAM AT 29 MeV

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The results of measurements of the angular distributions of deuterons in the 45Sc(3He, d)46Ti reaction are presented, from which the cross sections for population of the ground and excited states in the 46Ti nucleus were determined [1]. The energy of the bombarding 3He particles was 29 MeV.
The measured angular distributions for the excited states in the 46Ti nuclei are compared with the results of other measurements at several values of 3He energy. A comparison of the angular distributions for the ground and excited states of 46Ti with DWBA calculations showed that the pickup of a proton from 3He to the target nucleus mainly results in transfer of 3 or 1 units of angular momentum, which corresponds to the population of 1f7/2 and 2p3/2 shells, respectively. It was shown that rearrangement of nucleons in the unfilled 1f7/2 and 2p3/2 shells leads to excitation of both collective and particle-hole states with different angular momenta. The energy spectra of 46Ti obtained in the experiment were analyzed within the framework of the dinuclear system model [2].
For the 45Sc(3He, t)45Ti reaction, the spectrum of excited states of 45Ti was measured for the first time [3]. Significantly fewer excited states in the resulting 45Ti nucleus are populated compared to 46Ti; moreover, mainly low-lying single-particle states are populated.
The experiments were carried out at the accelerator of the Institute of Nuclear Physics, Řež, Czech Republic.
1. N. K. Skobelev, Yu. E. Penionzhkevich, V. Burjan, and J. Mrázek, Bulletin of the Russian Academy of Sciences: Physics 84, 425 (2020).
2. T.M.Shneidman, G.G.Adamian, N.V.Antonenko, R.V.Jolos, S.-G.Zhou, Phys.Rev. C 92, 034302 (2015).
3. N. K. Skobelev, Yu. E. Penionzhkevich, I. Siváček, T. Issatayev et al., Physics of Particles and Nuclei 53, 382 (2022).

The speaker is a student or young scientist

No

Section

1. Nuclear structure: theory and experiment

Primary author: Dr SKOBELEV, Nikolay

Co-authors: Mr D'AGATA, Guiseppe (NPI, Rez, Czech Republic); Mr SIVACEK, Ivan (JINR, NPIASCR); Dr MRAZEK, Jaromir (NPI, Rez, Czech Republic); ISSATAYEV, Talgat (JINR); SHNEIDMAN , Timur (JINR); Dr BURJAN, Vaclav (NPI, Rez, Czech Republic); Prof. PENIONZHKEVICH, Yuri (Joint Institute for Nuclear Research)

Presenter: Dr SKOBELEV, Nikolay

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