

ANALYTICAL COMPLEX ON THE BASIS OF THE ELECTROSTATIC ACCELERATOR “SOKOL”

M.K. ALIEV¹, G.R. ALIMOV¹, S. KALANOV¹, T.M. MUMINOV¹, R.F. RUMI¹, V.V. SKVORTSOV¹, R.I. KHALIKOV¹, I. KHOLBAEV¹, SH. KH. SHKOBILOV¹, V.N. BONDARENKO², L.S. GLAZUNOV², A.V. GONCHAROV², I.M. KARNAUKHOV², V.V. KUZMENKO², V.M. PISTRYAK², Y.I. SUKHOSTAVETS², S.V. ARTEMOV³, A. KARAKHODJAEV³, U.S. SALIKHBAEV³, N. BURTEBAEV⁴, D.M. ZAZULIN⁴

¹*Institute of Applied Physics National University of Uzbekistan, Tashkent*

²*Kharkov physic-technical institute NAS Ukraine*

³*Institute of Nuclear Physics AS, Tashkent*

⁴*Institute of Nuclear Physics NNC, Almaty*

An analytical complex of nuclear-physical devices is created on the basis of the electrostatic accelerator “SOKOL” (Institute of Applied Physics of National University of Uzbekistan, Tashkent). The complex enables to carry out the following:

1. Analysis of element content of solid samples and analysis of element's distribution on their surface and depth by PIXE, PIGE and RBS – methods.
2. Investigation of energy and angular distributions of the gamma-rays irradiated in capture reactions for light nucleus.
3. Radiation annealing the materials with the purpose of modification of their quality by beams of protons and ions of helium with energies $E=0,3-2,0$ MeV and current $J=5$ nA-10 μ A.

The following defectors are used: Si(Li) detector for X- rays with the energy resolution 165 eV on the MnK_{α} - line; HPGe defector with energy resolution 1,77 keV on the line 1332 keV

and scintillation detectors with the crystal's sizes $\varnothing 63 \times 63$ and $\varnothing 200 \times 100$ mm, with the energy resolution 9% and 10,5% correspondingly on the line 662 keV for γ -rays; PIPS detector with the energy resolution 12 keV on the line 5 MeV for the registration of backscattering particles.

The spectrometers are assembled by the standard schemes from the modules of nuclear electronics of ORTEC firm. The accumulation of spectrometric information is performed on multi-channel analyzer of impulses MULTIPORTII in the standard of NIM, CANBERRA firm. The processing of experimental data is performed by software of DBS (JINF, Dubna), and complex of programs developed by NNC KhPhTI (Kharkov, Ukraine) and program GENIE2000 of CANBERRA firm.