

THE INAA AND ICP-MS AND TRACK ANALYSIS OF THE BONE FINDS AND SOME PROBLEMS WITH RADIOGENIC DATING

A. Vasidov¹, B. Yuldashev¹, I. Strashnov², I. Izosimov³, B. Saidullaev¹

¹*Nuclear Physics Institute, Uzbekistan;* ²*The University of Manchester;* ³*Joint Institute for Nuclear Research*

E-mail: samad@inp.uz

The use of combination Instrumental Neutron Activation Analysis (INAA) and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and also track detector analysis (TDA) by type of CR-39 are very efficient for element analysis of the prehistoric and ancient bone samples.

By the INAA and ICP-MS were analyzed contents of 25 and 64 elements with ≤ 15 % errors, respectively. And a high concentration of uranium were detected in the bones of dinosaurs (122 mg/kg), mammoth (220 mg/kg) and archanthrope (1.5 mg/kg) compared to surrounding soils (3.7-7.8 mg/kg) and standard bones (<0.01 mg/kg).

It has been established that the concentration of migrant elements and nuclear fission products K, Sc, As, Sr, Mo, Ba, La, Ce, Nd, Sm, Eu and Yb have been 3-30 time more in prehistoric and ancient bones than in standard bone. It is follows the radiogenic dating methods with $^{14}\text{C}/^{14}\text{N}$, $^{40}\text{K}/^{40}\text{Ar}$, $^{89}\text{Rb}/^{89}\text{Sr}$, $^{147}\text{Sm}/^{147}\text{Nd}$, $^{238}\text{U}/^{206}\text{Pb}$ are not absolutely correct and reliable for bone finds, due to increasing values of radioisotopes in skeletons depending on the environment and being period.

For estimating the ages of bone finds was proposed determination of the ^{226}Ra activity by registration α -particles of ^{222}Rn , by using a CR-39 track detector in an isolated chamber. The comparison of the ^{226}Ra concentration in the bones of archanthropus, mammoths, dinosaurs between standard bones showed are being direct correlation between age and ^{226}Ra concentration in skeletons.