

temperature gradients, various filters, sorbents, etc. Efficiency of elements extraction from samples (rocks, ores, etc.) and transformation into volatile compounds reached 90-99% (As, Se, Mo, Sb, Re, Os, Ir, Hg). The sensitivity of these methods is sufficiently better than in INAA. The most important advantage of the method is possibility of some noble metals determination in hardly decomposing (dissolving) geological samples.

97-57 TRACE ELEMENTS AND DENTAL CARIES. E.A. Danilova, L.I. Zhuk, A.A. Kist, T.Kh. Saparov*, L.Kh. Khankeldieva** Institute of Nuclear Physics, Tashkent, Ulughbek, 702132, UZBEKISTAN * 1st Tashkent State Medical Institute, Tashkent, Khamza Str. 103, 700018, UZBEKISTAN ** Boukhara State Medical Institute, Boukhara, 720506, UZBEKISTAN

Assumption (on the base of previously published studies) that the dental caries is connected with environmental contamination and that deciduous teeth can be considered as an indicator of environment pollution status induced us to compare elemental composition of deciduous teeth taken from children from areas with various levels of contamination and various frequency of dental caries. Samples were taken from 140 children from three areas - a relatively clean urban area (dental caries frequency - 67%), a mildly polluted urban area close to a road with heavy traffic (dental caries frequency - 74%), and area close to factories (dental caries frequency - 75.3%). Using INAA Ca, Co, Cr, Fe, Mn, Na, Sb, Sc, Sr, Zn were determined. Statistically significant elevation of Cr, Mn, Co, Zn for the 3rd and Fe for the 2nd and 3rd zones was found. Concentration of Ca and Na for the 3rd zone was decreased. The following correlations with dental caries were found - strong negative for Na, Ca, strong positive for Mn, Zn, Sr, weak positive for Fe, statistically non-significant positive for Co, Cr, Sb. The results obtained allow to confirm the idea about connection of dental caries with environment contamination.

97-58 SELENIUM AND OTHER ELEMENTS IN INFECTIOUS HEPATITIS. L.I. Zhuk, A.A. Kist, E.I. Musabaev*, R.Kh. Dzhuraev**, T.Yu. Jashina. Institute of Nuclear Physics, Tashkent, Ulughbek, 702132, UZBEKISTAN * Medical Postgradual Education Institute, Tashkent, Petrov Str. 192, 700008, UZBEKISTAN **Uzbek Institute of Epidemiology, Microbiology and Infectious Diseases, Tashkent, Rashidov Str. 52, 700067, UZBEKISTAN

The most important reason of pathologic liver changes in hepatitis is oxidation of lipids in hepatocytes membrane. Taking into consideration the role of selenium in protection of cells against oxidation stress, we have studied selenium concentration in human blood (erythrocytes and serum) and hair. Samples were taken from 130 patients with acute and persistent viral hepatitis-B before and after 21 days of treatment. The treatment, besides usually accepted procedure, included also selenium given per os as sodium selenite (daily 100 microg). The same samples were taken from group of healthy people. Samples were analyzed using INAA. The following elements were determined Cr, Fe, Hg, Rb, Sb, Se, and Zn. In the case of persistent hepatitis we did not find statistically significant differences. In the case of acute hepatitis strongly significant were differences for selenium and iron in serum and hair (selenium is decreased in sick and increases close to healthy level after treatment, behavior of iron is opposite). In samples taken from patients antimony was also elevated. Efficiency of treatment with selenium was significantly higher than that of regular procedure. Possible biochemical mechanism is discussed.

97-60 A PRELIMINARY STUDY ON MERCURY DISTRIBUTION IN SOIL PROFILES FROM SERRA DO NAVIO USING RADIOCHEMICAL NEUTRON ACTIVATION ANALYSIS. C. Gonçalves, D.I.T.Fávaro, S.M.B. Oliveira, R.I. Boulet, M. Saiki, Instituto de Pesquisas Energéticas e Nucleares - IPEN-CNEN/SP CP 11049 - CEP 054922-970 - São Paulo - SP - BRAZIL

This study presents preliminary results on mercury distribution, released by gold mining activities, in soils from Vila Nova River region, an area located in Serra do Navio, Amapá, in the Brazilian Amazon.

Mercury is used in a rudimentary mining process to amalgamate the fine gold particles and to separate from the other mineral components in the bottom gravel. The soil samples were separated in two grain sizes, sand and clay + silt, and have been analysed by radiochemical neutron activation analysis. Samples and Hg standard were irradiated for 16 hours in quartz vials, under 10^{12} n cm⁻² s⁻¹ thermal neutron flux, in the IEA - R1 reactor from IPEN/CNEN-SP. Determination of total Hg was carried out by using the ²⁰³Hg and ¹⁹⁷Hg radioisotopes. The method has consisted in the irradiated soil samples leaching with aqua regia in a Parr bomb placed in a domestic microwave and subsequent Hg extraction with bismuth diethyldithiocarbamate selectively. Mercury contamination has been clearly detected along Vila Nova River, where Hg levels have reached values up to 18 mg/kg. In some areas the results have showed Hg levels similar to the chosen unpolluted area - Igarapé Pedra Preta basin. Mercury concentration were higher at the surface of soils decreasing to values of 0.18 to 0.45 mg/kg in deeper layers. The precision and accuracy of the method were verified by means of analysis of the reference material GXR-5 (USGS).

97-61 SEPARATION OF ⁶⁸Ga FROM ⁶⁸Ge ON ALUMINA. S. Kh. Egamediev*, S. Khujaev. Institute of Nuclear Physics, Uzbekistan Academy of Sciences, Tashkent, Ulughbek, 702132, Uzbekistan.

Systematic studies of the adsorption of carrier-free ⁶⁸Ge on alumina have been made. These studies include adsorption of ⁶⁸Ge on alumina in dilute HCl, neutral and dilute basic solutions (pH 1-12), in moderately acidic solutions (0.1-4M HCl, HNO₃, H₂SO₄), in sodium hydroxide solutions (0.005-2M NaOH). Adsorption behavior of gallium-68 daughter radionuclide is examined by desorption method in order to find the best conditions for separation of both radionuclides. The elution yield of ⁶⁸Ga from column of alumina with adsorbed ⁶⁸Ge is 60-65% with dilute HCl solutions (<0.1 M). The gallium fractions obtained was very pure, the amount of germanium-68 in eluate was less than 0.005%.

97-62 TESTING OF DIFFERENT TRUE COINCIDENCE CORRECTION APPROACHES FOR GAMMA-RAY SPECTROMETRY OF VOLUMINOUS SOURCES. V.P.Kolotov*, M.J.Koskelo¹. Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Sciences, Kosygin str. 19, Moscow B-334, 117975 RUSSIA, ¹ Canberra Industries Inc., Meriden, CT, USA

To achieve the highest possible sensitivity of analysis for environmental samples it is common practice to use both a high efficiency detector and a close measurement geometry with a large sample size (e.g. Marinelli beaker). Under such conditions, the typical efficiency calibration procedures results in a biased activity value for many nuclides due to the true coincidence summing effect. While there are a few methods to correct for this effect with special calibration standards, such a calibration can be both time consuming and expensive. Due to these calibration difficulties, the true coincidence summing effect is often simply ignored. Recently, it has been demonstrated that the coincidence summing correction can be performed mathematically even for voluminous sources[1]. This new method consists of an integration of the coincidence correction factor over the sample volume while taking into account its chemical composition and the container. In this paper, we will discuss the latest approaches for establishing the peak efficiency and peak-to-total efficiency curves, which are required for this method. These approaches have been tested for HPGe detectors of two different relative efficiencies. The presentation will also include the experimental results of our testing.

97-63 ENVIRONMENTAL RADIATION AT THE SEMIPALATINSK NUCLEAR TEST SITE AND SURROUNDING VILLAGES. A. R. Hutter, P. Shebell. U. S. Department of Energy, Environmental Measurements Laboratory, New York, NY 10014-3811, USA.

The former Soviet Union's largest nuclear test site was located near Semipalatinsk, Kazakhstan. The International Atomic Energy Agency committed to studying the present environmental contamination and the resulting radiation exposure risk to the population from the ~ 450 nuclear detonations performed at