research works after 1950s. Ultimately these nuclear techniques contributed greatly in increased plant production. In general, it is possible to separate the nuclear techniques used in soil fertility and plant nutrition into to groups. The first group is the use of radioactive and stable isotopes as a tracer in order to find out the optimum fertilization rate of plants precisely. The second group is the use of neutron probe in determining the soil moisture at different periods of the growing season and at various soil depths precisely without any difficulty.

In research works where conventional techniques are used, it is not possible to identify how much of the nutrient taken up by the plant came from applied fertilizer or soil. However, when tracer techniques are used in research works it is possible to identify precisely which amount of the nutrient taken from fertilizer or from soil. Therefore, the nuclear techniques are very important in finding out which variety of fertilizer and how much of it must be used.

The determination of the soil moisture is very important in finding the water needs of the plants for a good growth. Soil moisture contents changes often during the growth period, so it must be determined very frequently in order to determine the amount of irrigation that has to be done. Conventional soil moisture determination (gravimetric method) is very laborious especially when it has to be done frequently. However, by using neutron probe soil moisture determinations can be done very easily any time during the plant growth period.

RADIOCHEMICAL NEUTRON ACTIVATION ANALYSIS OF ZIRCONIUM AND ZIRCONIUM-NIOBIUM ALLOYS

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Zirconium and zirconium-niobium alloys are used on nuclear technology, as fuel cladding of nuclear reactors. Their nuclear-physical, mechanical and thermophysical properties are influenced them matrix and impurity composition, therefore determination of matrix and impurity content of these materials is a very important task

Neutron activation analysis is one from multielemental and high sensible techniques that are widely applied in analysis of high purity materials. Investigation of nuclear-physical characteristics of zirconium has shown that instrumental variant NAA is unusable for analysis due to high radioactivity of a matrix. Therefore it is necessary carrying out radiochemical separation of impurity radionuclides from matrix. Study of the literature datum have shown, that zirconium and niobium are very well extracted from muriatic solution with 5% tributyl phosphinoxide (TBPO) solution in toluene and 0,75 M solution of di-2-ethyl hexyl phosphoric acid (HDEHP) in cyclohexanone. Investigation of these elements extraction in these systems has shown that more effective and selective separation of matrix radionuclides is achieved in HDEHP-3M HCl system. This system is also extracted and hafnium, witch is an accompanying element of zirconium and its high content prevented determination of other

impurity elements in sample. Therefore we used extraction system HDEHP-3M HCl for analysis of zirconium and zirconium-niobium alloys in chromatographic variant.

By measurement of distribution profile of a matrix and of elution curve of determined elements is established, that for effective separation of impurity and matrix radionuclides there is enough chromatographic column with diameter 1 cm and height of a sorbent layer 7 cm, thus volume of elute, necessary for complete elution of determinate elements is 35-40 ml.

On the basis of the carried out researches the technique of radiochemical NAA of high purity zirconium and zirconium-niobium alloy, which allows to determine up to 25 impurity elements with detection limits of 10^{-5}-10^{-9}% mass have been developed.

INTERNATIONAL STANDARDS AND AGREEMENTS IN FOOD IRRADIATION

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The economies of both developed and developing countries have been effected by their exported food and agricultural products. Trading policies of food and agricultural products are governed by international agreement as well as national regulations. Trade in food and agricultural commodities may be affected by both principal Agreements within the overall World Trade Organization (WTO) Agreement, though neither specifically refers to irradiation or irradiated foods. The principal Agreements are the Technical Barriers to Trade (TBT) Agreement and the Sanitary and Phytosanitary (SPS) Agreement. The SPS of the WTO requires governments to harmonize their sanitary and phytosanitary measures on as wide basis as possible. Related standards, guidelines and recommendations of international standard setting bodies such as the Codex Alimentarius Commission (food safety); the International Plant Protection Convention (IPPC) (plant health and quarantine); and International Office of Epizootics (animal health and zoonoses) should be used in such a harmonization. International Standarts for Phytosanitary Measures (ISPM) no.18 was published under the IPPC by FAO (April 2003, Rome-Italy). ISPM standard provides technical guidance on the specific prodecure for the application of ionizing radiation as a phytosanitary treatment for regulated pests or articles. Moreover, Codex Alimentarius Commission, Codex General Standard for Irradiated Foods (Stand 106-1983) and Reccomended International Code of Practice were first published in 1983 and revised in March 2003. Scope of this standard applies to foods processed by ionizing radiation that is used in conjunction with applicable hygienic codes, food standards and transportation codes. It does not apply to foods exposed to doses imparted by measuring instruments used for inspection purposes. Codex documents on Principles and Guidelines for the Import/Export Inspection and Certification of Foods have been prepared to guide international trade.On the other hand national regulations should take account of internationally agreed Codes and Guidelines regarding the irradiation facilities and radiation processing.