Contribution ID: **210** Type: **Verbal**

Elemental concentrations in vegetable species from industrial zones in Romania determined by INAA

Friday, 23 April 2010 03:45 (15 minutes)

The environmental pollution by industrial activities presents a significant health risk to the man. One of the possible pathways of pollutants from the environment to human organisms is the consumption of foodstuffs polluted by industrial activities. This paper presents the levels of elemental concentrations determined by Instrumental Neutron Activation Analysis (INAA) in various vegetable species cultivated in industrial zones of Romania and control sites with no specific type of pollution. The following industries were considered: phosphorous fertilizer production at Turnu Magurele, non-ferrous metallurgy at Copsa Mica, iron and steel metallurgy at Targoviste. INAA was applied at IFIN-HH in Magurele (near Bucharest) for the long-lived radioisotopes (TRIGA nuclear reactor in Pitesti) and JINR Dubna for the short-lived radioisotopes (IBR-2 reactor in Dubna). The elements determined were: Al, Ag, As, Au, Ba, Br, Ca, Cd, Ce, Cl, Co, Cr, Cs, Cu, Eu, Fe, Hf, K, La, Mn, Mo, Na, Ni, Rb, Sb, Sc, Se, Sm, Sr, Ta, Tb, Zr, and Zn. Elemental concentration results are compared with Romanian standards and values from the literature. Elemental bioavailability of the investigated plant species and their contamination with trace elements due do industrial activities are discussed. This research was supported by the PN 09370105 and PNCDI II 72-172/01.10.2008 Projects of the Education, Research and Youth Ministry in Romania and Joint Research Project No. 3871-4-08/10 between JINR Dubna, Russia and IFIN-HH, Romania.

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Session Classification: Nuclear Analytical Methods 6

Track Classification: Nuclear Analytical Methods