

EVALUATION OF INORGANIC COMPONENTS IN MINERAL SUPPLEMENTS BY NEUTRON ACTIVATION ANALYSIS

R.A.S. Reis, M. Saiki*

*Instituto de Pesquisas Energéticas e Nucleares, IPEN/CNEN-SP, Neutron Activation Analysis
Laboratory; Avenida Professor Lineu Prestes, 2242, Cidade Universitária, CEP 05508-000
São Paulo - SP, Brazil; mitiko@ipen.br*

The control of element composition in nutritional supplements is of great interest due to increasingly higher consumption and a large diversity and brands of these products offered in the market. Therefore, there is a necessity of evaluating the element contents in supplements and to compare with those values declared on the labels. In this study neutron activation analysis (NAA) was applied to evaluate the element composition of eleven commercial nutritional supplement brands bought in natural product drugstores and pharmacies. These samples acquired in capsule or tablet forms were ground to a homogeneous powder. The samples were irradiated along with synthetic element standards in the IEA-R1 nuclear research reactor. Irradiations of 8 h under a thermal neutron flux of $5 \times 10^{12} \text{ n cm}^{-2} \text{ s}^{-1}$ were carried out for Ca, Co, Cr, Fe, Se and Zn determinations. For Cu, K and Na determinations thermal neutron flux of $1 \times 10^{12} \text{ n cm}^{-2} \text{ s}^{-1}$ was used however, the exposure time was 1h. The induced gamma activities were measured using an HPGe detector coupled to a gamma ray spectrometer. The obtained results for Ca, Se, Zn and multimineral supplements as well as multivitamins compared with the values of their labels indicated good agreement for most of the elements. Toxic elements such as As, Cd, Hg and Sb were not detected in the samples. The highest concentration of Na was found in some multimineral supplements suggest an evaluation of whether or not to prescribe these products presenting high level of Na to hypertensive individuals. Certified reference materials NIST 1400 Bone Ash and NIST 1633b Coal Fly Ash analyzed for quality control showed good precision and accuracy of the results.