

COMPARISON OF THE SEMI-PARAMETRIC NAA WITH INAA TO DETERMINE  
MAJOR TRACE ELEMENTS IN SERUM FOR CLINICAL PRACTICE

L.C. Oliveira<sup>1</sup>, C.B. Zamboni<sup>1\*</sup>, L. Kovcas<sup>1</sup>, J.A.G. de Medeiros<sup>1</sup>, M.R Azevedo<sup>2</sup>

<sup>1</sup> Instituto de Pesquisas Energéticas e Nucleares -IPEN /CNEN-SP  
Av. Professor Lineu Prestes 2242  
05508-000 São Paulo, SP- Brasil  
czamboni@ipen.br

<sup>2</sup>Universidade Santo Amaro - UNISA  
R. Professor Enéas de Siqueira Neto 340  
04829-300, São Paulo, SP -Brasil

The semi-parametric neutron activation analysis (a variant of  $k_0$  – method) and the instrumental neutron activation analysis techniques were applied for evaluation of some elements' concentrations of clinical relevancy (Ca, Cl, K and Na) in serum samples of human being. The serum samples from 20 volunteers (male and female, age between 18 and 65 years and above 50 kg.) were prepared by dropping convenient aliquot (200 $\mu$ l of serum) onto Whatman filter paper. In the semi-parametric procedure gold foils was used for the measurement of thermal flux distribution and, in the comparative procedure the reference material from the National Institute of Public Health - Québec (ICP02-05) was used. The standard was prepared by following the same procedure (aliquot of 200 $\mu$ l spread in filter paper) and irradiated with the serum sample. The irradiation was performed in a pneumatic station of the IEA-R1 nuclear reactor at IPEN/SP (2-4MW, pool type, thermal neutron flux of  $\sim 10^{12}$  n.cm<sup>-2</sup>s<sup>-1</sup>) using an irradiation time of 3 minutes. Considering that these techniques are not destructive the same serum sample was used for both analyses. A comparison with the conventional analyses (Ca by Colorimetry; Cl by Titrimetry; K and Na by Ion Specific Electrode) was performed permitting a discussion about advantages and disadvantages of using each method.

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