TRACE ELEMENT RESEARCH AT THE RADIOCHEMISTRY DIVISION (IPEN/CNEN-SP—BRAZILIAN NUCLEAR ENERGY COMMISSION) USING NEUTRON ACTIVATION ANALYSIS

M.B.A. Vasconcellos, M.J.A. Armelin, D.I.T. Fávaro, A.M.G. Figueiredo,
C.S. Munita, V. A. Maihara, R.P. Paiva and M. Saiki
Radiochemistry Division, IPEN/CNEN-SP, P.O. Box 11049, CEP 05422-970, São
Paulo/SP—Brazil

Several applications of neutron activation analysis (NAA) are being developed at the
Radiochemistry Division of IPEN/CNEN-SP (Brazilian Nuclear Energy Commission)

concerning trace element determinations for studies in the biological, nutritional and environmental fields.

Due to its multielemental analysis characteristics, coupled to high accuracy, precision and absence of blank determination, NAA can be successfully used for analysis of: toxic elements like Hg, Cd, As, Sb, nutritionally important elements like Ca, Cl, K, Mg, Na, Fe, Zn, Se, Mn, Cr, Mo, Co and several others, such as Ba, Hf, Ce, La, Lu, Sm, Eu, Rb, Sc, U and Th.

Research works currently being addressed at the Radiochemistry Division of IPEN include analysis of rain water of São Paulo for pollution source apportionment, analysis of mercury species in human hair, fish and sediments from the Amazonic region of Brazil, multielemental analysis of biomonitors such as lichens and plastic materials used as containers for foodstuffs, blood and cleaning materials.

Also Brazilian diets and foodstuffs from several regions of the country are being analyzed, as well as agroindustrial by-products used in feeding of ruminants, grasses and legumes and also animal tissues such as liver, hair and bone.

Among important studies concerning applications of NAA to biological samples are included the multielemental analysis of Brazilian snake venoms, human hair, bones and nails, Brazilian medicinal plants.