the different origins) maybe used to manufacture serum unchanged in the final product, as regards the toxicity of inorganic elements. In this investigation, we intend to check the elemental characterization of this antidote using Neutron Activation Analyses technique (NAA). The NAA measurements were performed in the IEA-R1 nuclear reactor (IPEN/CNEN-SP, Brasil). Each sample was irradiated for 120s and gamma counting endured 300s, HPGe detector (ORTEC-GEM 60195) coupled to a MCA (ORTEC - 919E) used. The elements concentration were obtained using the ATIVAÇÃO software. These quantitative analysis of the antilonomic serum will generate data to evaluate the possibility of establishing a standard extract, which would reduce costs in the antilonomic serum production process, as well as improvements in serum production process antilonomic in the Butantan Institute, meeting the standards of good manufacturing practices and good laboratory practice.

ELEMENTAL COMPOSITION DETERMINATION IN MEDICINAL PLANTS BY NEUTRON ACTIVATION ANALYSIS P11

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The use of medicinal plants in the prevention and treatment of diseases is mainly due to its low costs, ease acquisition and cultural aspects. In addition, the absence of its side effects when compared with synthetic drugs and the belief that plants that are natural origin do not cause harmful effects to the organism have stimulated their uses. However, medicinal plants may contain excess essential elements as well as the toxic ones that even in low concentrations are dangerous to human health. The objective of this study was to analyze medicinal plants: Aloe vera (Babosa), Morus nigra sp. (Amoreira) and Moringa oleifera (Moringa) for further correlation studies of the chemical elements with their therapeutic activities. The analytical method used was neutron activation analysis (NAA). The leaves of Aloe vera and Morus nigra were collected in different localities and that of Moringa oleifera were acquired in a store of natural products. Sample preparation consisted of cleaning, drying and milling the leaves. Aliquots of the samples and synthetic element standards were irradiated for 16h under thermal neutron flux of 5×10^{12} n cm^{-2} s^{-1} of the nuclear reactor IEA-R1. The induced gamma activities were measured using a gamma ray spectrometer coupled to a HPGe detector. The radioisotopes formed were identified by half-lives and gamma ray energies. Element concentrations were calculated by comparative method. Quality of the results was evaluated by analyzing certified reference materials INCT-TL-1 Tea Leaves and INCT-MPH-2 Mixed Polish Herbs and the results showed good precision and accuracy. Elements Ca and K were obtained at high concentrations in the plants at the percentage levels. Calcium exhibits neutralizing action and avoids stomach lesions and K has a diuretic action. Elements Br, Fe, Na, Rb and Zn were found in the order of μg g^{-1}, and As, Co, Cr, Cs, La, Sb and Sc at lower concentrations, in the order of ng g^{-1}. The Aloe Vera plant

presented high concentration of Zn and this element is present in healing remedies. Molibdenum was detected in Moringa oleifera sample and this element is considered essential in many enzymatic processes of the organism. Toxic elements such as Cu and Cd were not detected and As and Sb were found but at very low concentrations. Results obtained in this work indicate the possibility of applying NAA in the correlation studies between the elements present in the plants and their therapeutic effects.

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P12 ELEMENTAL CHARACTERIZATION USING INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS IN MINERAL WATERS FROM CAXAMBU, MG

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Chemical composition of mineral water is the result of soil and water interaction and depends on the soil geology, because the chemical elements become part of these waters through the leaching and dissolution processes of soil. Mineral waters are defined as those that come from natural springs or that are artificially collected with chemical composition or physical chemical properties which imbues them with medicinal action that distinguishes them from ordinary water.

According to the mineral summary of Departamento Nacional de Produção Mineral - DNPM, the consumption of mineral water has been increasing year by year, being in 2014 the global consumption 6.2% greater than in 2013 (which already had consumption 7.0% greater than in 2012), a fact that reinforces the importance of the characterization and regulation of the mineral waters. In thermal parks as Caxambu's park, the waters are used as health therapy, diuretic waters, cathartic waters and anti-inflammatory waters. Parque das Águas of Caxambu, the largest mineral water park in the world, has 12 springs: Leopoldina, Beleza, Duque de Saxe, Princesa Isabel and Conde D'Eu, Dom Pedro, Viotti 1 and 2, Venâncio, Mayrink I, II and III and Ernestina Guedes and also a 60 m deep geyser. Thus, the main goal of this study was to perform a chemical characterization of these waters in which the elements Ba, Ca, Co, Cr, Cs, Eu, Fe, K, La, Na, Rb and Sb were found using Instrumental Neutron Activation Analysis – INAA technique. Mineral water samples were dried in a cellulose substrate and irradiated at the IEA-R1 reactor in which they were exposed for 6h to a thermal neutron flux of 10^{12} neutrons per cm^2 per second.

The results showed a similar behavior among the samples and it was possible to identify a higher concentration of Na, K and Fe and predominance of alkaline and alkaine earth metals in all samples. Further, Venâncio, Beleza, Ernestina springs and geyser showed the highest concentrations of these elements.
