

## ELEMENT CONCENTRATION DETERMINATIONS IN TREE BARKS COLLECTED IN A CAR PARKING. PRELIMINARY RESULTS FOR BIOMONITORING STUDIES

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Tree barks are considered to be a promising indicator of air pollution monitoring due to its wide distribution, simplicity of tree species identification, sampling without causing damage to the tree and easier sample treatment. Besides, the surface layers of tree barks have been considered as a potential indicator of air pollution since they retain pollutants directly from the air or from the rainwater running down the stems. In addition, bark surface is inert porous material and the absence of metabolic processes makes it almost inert in the presence of inorganic and organic substances. The aim of this study was to analyze tree barks collected in a car parking at the Nuclear and Energy Research Institute, IPEN-CNEN/SP in order to identify the origin of elements present in these samples. Barks from Sibipiruna (*Poincianella pluviosa*) collected at a height of 1.5m from the topsoil were cleaned using a nylon brush. Then a surface layer of 3 mm was removed using a Ti grater and ground in an agate mortar for the analyses. Instrumental neutron activation analysis (INAA) was applied for the determination of As, Br, Ca, Co, Cr, Fe, K, La, Na, Rb, Sb, Sc and Zn. Aliquots of the samples weighed in polyethylene involucre and synthetic standards of elements were irradiated at the IEA-R1 nuclear research reactor under a thermal neutron flux of about  $4.2 \times 10^{12} n \text{ cm}^{-2} \text{ s}^{-1}$  for 16h. After adequate decay times, the irradiated samples and standards were measured using a HPGe detector coupled to a Digital Spectrum Analyzer. The radionuclides in the irradiated samples were identified by half-lives and gamma ray energies. For analytical control of the results, certified reference materials (CRMs) INCT-MPH-2 Mixed Polish Herbs and IAEA 336 Lichen were analyzed. The element concentrations were calculated by comparative method. Results obtained in CRMs presented relative standard deviations and relative errors lower than 10.0% for most of elements determined. Findings of this study demonstrated that the INAA can provide reliable data for element concentrations in tree barks. Preliminary results obtained in bark samples can be used for determining elements originated from different emission sources such as vehicular, suspension of the soil and from tree bark itself.

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