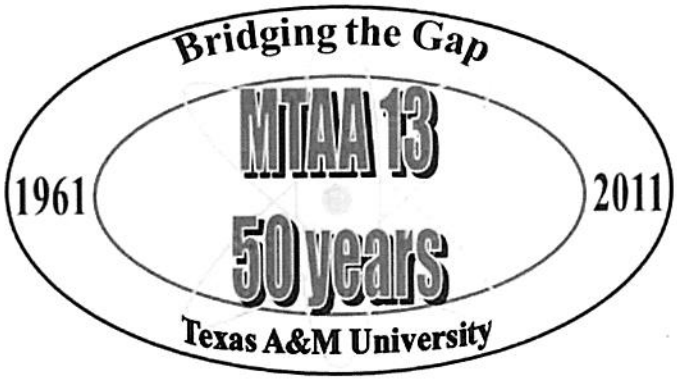
THIRTEENTH INTERNATIONAL CONFERENCE ON MODERN TRENDS IN ACTIVATION ANALYSIS
MTAA-13

PROGRAM AND ABSTRACTS



Celebrating the 50th Anniversary of the conference series under the auspices of the International Committee on Activation Analysis (ICAA) and in cooperation with the American Nuclear Society (ANS) and the International Atomic Energy Agency (IAEA).

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LOG 183

Metals and Semi-Metals in Street Soils of São Paulo City, Brazil

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São Paulo is the largest city in Brazil with about 20 millions inhabitants in the metropolitan area, more than 9 million motor vehicles and strong industrial activity at the metropolitan region, which are responsible for increasing pollution in the region. Nevertheless, there is little information on metal contents in the metropolitan region soils, which would be very useful as a fingerprint of the environmental pollution. The present study aimed to determine As, Ba, Co, Cr Sb and Zn concentrations in soils adjacent to avenues of highly dense traffic downtown São Paulo city to assess their possible sources and potential environmental impact. The analytical technique employed was Instrumental Neutron Activation Analysis (INAA). The results show metal concentration levels higher than the reference values for soils of São Paulo, according to the Environmental Protection Agency of the State São Paulo (CETESB) guidelines. As, Ba and Zn showed concentration levels above the Intervention Values in some points, indicating direct or indirect potential risks to human health. The traffic related element Ba, Sb and Zn presented concentrations above the Prevention Values in points with high density traffic and may be associated to vehicular emissions. The high concentrations obtained suggest a potential damage to soil quality which in turn would affect human health.

LOG 184

Xenon Diffusion Studies with Prompt Gamma Activation Analysis

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The transport of Xe in an underground environment is vital to understanding how noble gas releases from covert nuclear weapon tests. Radioxenon monitoring is a vital part of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) International Monitoring System (IMS). This work aims to improve the understanding of radioxenon emissions within the context of CTBT monitoring.

The University of Texas at Austin maintains a prompt gamma activation analysis (PGAA) facility on beam port 3 of their TRIGA Mark II reactor. This facility is coupled with a cold neutron source, neutron guides, and a parabolic neutron focusing element. At the optimal sample point the neutron beam has a flux of 1×10^7 n cm^{-2} s^{-1} and a diameter of roughly 1 cm. Due to the high thermal radiative capture neutron cross-sections of many stable Xe isotopes (*e.g.*, 165 b for ^{124}Xe, 21 b for ^{129}Xe, 26 b for ^{130}Xe, and 85 b for ^{131}Xe), PGAA is a suitable technique for *in-situ* non-destructive analysis for xenon. Initial experiments have been conducted to determine the detection limits for measurements of xenon in a nitrogen-xenon mixture at different concentrations. A test chamber has also been designed and constructed to utilize PGAA to measure Xe diffusion through geological materials (*e.g.*, sand, soil, etc..). The results from these experiments will be utilized to benchmark parts of underground Xe transport models and to determine diffusion coefficients for various materials.