

**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).

**Center for Chemical Characterization and Analysis,
Department of Chemistry, Texas A&M University
College Station, Texas, USA
March 13-18, 2011**

Conference Program

Overview:

Sunday, March 13 – George Bush Presidential Library Rotunda

- 4:00 – 6:00 p.m. Registration
- 6:00 – 8:00 p.m. Welcome Reception

Monday, March 14 – Interdisciplinary Life Sciences Building Auditorium

- 7:00 a.m. – 5:00 p.m. Registration
- 8:30 a.m. Welcome and Opening Remarks
- 8:50 – 9:20 a.m. Session MOAMA: MTA 50th Anniversary Review
- 9:20 – 10:40 a.m. Session MOAMB: Fritz Grass Memorial Session
- 11:00 a.m. – 12:00 p.m. 2010 Hevesy Award Ceremony and Lecture
- 1:00 – 2:40 p.m. Session MOPMA: Facility and Method Development (I)
- 3:10 – 4:50 p.m. Session MOPMB: Facility and Method Development (II)

Tuesday, March 15 - Interdisciplinary Life Sciences Building Auditorium

- 7:00 a.m. – 5:00 p.m. Registration
- 8:00 – 10:00 a.m. Session TUAMA: Epidemiology and Trace Elements in Medicine
- 10:30 a.m. – 12:20 p.m. Session TUAMPA: Poster Session A
- 1:20 – 3:00 p.m. Session TUPMA: Nuclear Imaging in Medicine
- 3:30 – 5:00 p.m. Session TUPMB: Introductions to Special Symposia
- 5:30 – 6:30 p.m. Buffet dinner and special symposia – Hagler Center
 - 6:30 – 8:30 p.m. Session TUPMC: Nano-technology
 - 6:30 – 8:30 p.m. Session TUPMD: Archaeometry
 - 6:30 – 8:30 p.m. Session TUPME: Nuclear Forensics/Border Security

Wednesday, March 16 - Interdisciplinary Life Sciences Building Auditorium

- 7:00 a.m. – 5:00 p.m. Registration
- 8:00 – 10:20 a.m. Session WEAMA: Applications in Environmental Studies
- 10:50 a.m. – 12:30 p.m. Session WEAMB: Applications in Agriculture and Foods
- 1:00 – 2:40 p.m. Session WEPMA: Applications in Geochemistry
- 2:40 - 3:00 p.m. Buses load for trip to the Houston Livestock Show and Rodeo

Thursday, March 17 - Interdisciplinary Life Sciences Building Auditorium

- 8:00 a.m. – 5:00 p.m. Registration
- 9:00 – 10:40 a.m. Session THAMA: Nuclear Beams and PGAA
- 11:10 a.m. – 1:00 p.m. Session THAMPB: Poster Session B
- 2:00 – 3:40 p.m. Session THPMA: Prompt Gamma Activation Analysis
- 4:10 – 5:50 p.m. Session THPMB: Method Enhancements/RNAA/Speciation
- 6:30 – 8:30 p.m. Conference Banquet and 2011 Hevesy Award Ceremony and Lecture

Friday, March 18 - Interdisciplinary Life Sciences Building Auditorium

- 7:00 – 10:00 a.m. Registration
- 8:00 – 9:40 a.m. Session FRAMA: Metrology/QC/Standards (I)
- 10:00 – 11:00 a.m. Session FRAMB: Metrology/QC/Standards (II)
- 11:00 a.m. – 12:00 p.m. Session FRAMC: Next Generation/Conference Closing

LOG 151

Elemental Composition Evaluation in Lichens from an Industrial Area of Shale Oil Processing in São Mateus do Sul, Parana, Brazil

Angélica B. Ferreira^{1,2}, Mitiko Saiki¹, José O. Santos³, Andreza P. Ribeiro⁴ and Paulo H.N. Saldiva²

¹*Instituto de Pesquisas Energéticas e Nucleares, IPEN-CNEN/SP, São Paulo, SP, Brazil*

²*Faculdade de Medicina, FM-USP, Departamento de Patologia, São Paulo, SP, Brazil*

³*Centro Federal de Educação Tecnológica de Sergipe, Aracaju, SE, Brazil*

⁴*Instituto Oceanográfico, IO-USP, São Paulo, SP, Brazil*

Lichens have been known as useful biomonitors since they accumulate heavy metals, pollutant gases and radionuclides to a greater degree than higher plants. In this study, the possibility of using lichens as biomonitors of emissions from a shale oil processing plant operating in São Mateus do Sul, PR, Brazil was verified. *Canoparmelia texana* lichenized fungus species was chosen for passive biomonitoring. Lichens collected in six different sites of this city were cleaned, freeze-dried, ground to a powder and analyzed by neutron activation analysis. Shale element composition was also evaluated to examine association with the elements found in lichens. Aliquots of samples were irradiated at the IEA-R1 nuclear reactor for long periods along with synthetic element standards. The gamma activities of samples and standards were measured using a HPGe detector coupled to a gamma ray spectrometer. Element concentrations found in lichens from São Mateus do Sul were compared with those obtained from lichens collected from clean areas of the Atlantic Forest in São Paulo State. Concentrations of As, Ca, Co, Cr, Cs, Fe, Sb, Sc, U and La in lichens from São Mateus do Sul were higher than those in lichens from the control sites. However, K was obtained at lower concentrations probably due to environmental stresses that affect element uptake. But Br, Rb and Zn showed no significant differences. The elements found in lichens were the same as those present in shale but at lower concentrations. Results obtained indicate the feasibility of using lichens in the evaluation of emissions from oil shale processing plant.

LOG 152

45 Years of Neutron Activation Analysis in Slovenia: Achievements Towards Improved Quality of Measurements Results

Borut Smodiš

Department of Environmental Sciences, Jožef Stefan Institute, Ljubljana, Slovenia

The TRIGA Mark II reactor of Jožef Stefan Institute became critical in the year 1966. Soon after its commissioning, the installation has become to be utilized for neutron activation analysis (NAA). Early applications were dedicated to development of radiochemical procedures for determining trace elements in the environment and in human health. Particular emphasis was devoted to studying the effects of the Idrija mining and milling activities onto the environment and man. RNAA procedures for the determination of numerous elements were developed and successfully applied in characterizing Standard Reference Materials prepared by NBS, a predecessor of the National Institute of Standards and Technology. Simultaneously, procedures for the determination of long-lived radionuclides by combination of NAA and other radiometric methods have been developed and applied. Along with the development of nuclear and gamma spectrometric equipment in late seventies and early eighties, INAA has attracted ever more applications, gradually replacing the RNAA procedures, whenever applicable. Further decline in the application of RNAA occurred as consequence of introduction of other modern analytical techniques. In the late eighties, the k_0 -based NAA was introduced, gradually replacing the relative method of INAA, eventually resulting in its accreditation as a routine analytical tool in 2009. Nowadays, the k_0 -NAA is used as primary analytical tool, along with the RNAA as a dedicated technique in cases where it prevails due to its advantages over the other analytical methods. In the presentation, the main success stories over the years are shown, the educational aspects are outlined, and the contributions towards improved quality of analytical measurements are discussed.