American Nuclear Society
International Topical Conference

ABSTRACTS

Ninth International Conference on Methods and Applications of Radioanalytical Chemistry

MARC IX

March 25-30, 2012

Log: 276. **QUANTITATIVE STUDY OF NON-STIMULATED HUMAN WHOLE SALIVA USING NAA**. H R Lewgoy(1), C. B. Zamboni(2), S. Metairon(2), I. M. M. A Medeiros(2). (1)Universidade Anhanguera Bandeirante, UNIBAN; (2)Instituto de Pesquisas Energéticas e Nucleares, IPEN - CNEN/SP.

In the last years, the use of saliva has increased as a way of diagnosing. Investigations of flow rates, pH, molecular components, hormones and proteins have been presenting a significant progress in clinical testing for diagnostics. The inorganic elements also have an important correlation that can assist, especially in periodontal disease, but these salivary components are still poorly investigated. The major advantage for using saliva in diagnosis, comparatively to serum and plasma, is the easy access and facility of collection (non-invasive). We investigated the whole non-stimulated saliva of 54 healthy subjects and 12 patients with periodontal disease using NAA technique. The samples were obtained from donors at São Paulo city (Brazil). The analyses were performed in the nuclear reactor IEA-R1 (3.5-4.5MW, pool type) at IPEN/CNEN-SP (Brazil). We found considerable metabolic changes, mainly in Ca and I.

Log: 277. **ELEMENTAL ANALYSIS OF BIOLOGICAL TISSUES OF DMDMDX/J AND C57BL/6J MICE STRAINS INVASTIGATED BY NAA**. S Metairon(1), C B Zamboni(1), M F Suzuki(1), C R Bueno Jr (2) O A Sant'Anna (3). (1)Instituto de Pesquisas Energéticas e Nucleares, IPEN - CNEN/SP, (2) Centro de Estudos do Genoma Humano, Instituto de Biociências, USP, (3) Instituto Butantan.

Biological tissues from DMDmdx/J dystrophic mice (male = 9 and female = 10) as well as C57BL/6J control group mice (male = 12) were investigated using NAA. These animals were obtained from Jackson Laboratory (Maine, USA) and later inbred at IPEN – CNEN/SP (São Paulo, Brazil). All the analyses were performed in the nuclear reactor IEA-R1 (3.5MW, pool type) at IPEN. The DMDmdx/J mouse strain is relevant as an experimental model for Duchenne Muscular Dystrophy (DMD), which is the most severe and prevalent type of muscular dystrophy. To show in more details the alterations that this disease may cause in blood, tibia, quadriceps and heart, correlations matrixes of the DMDmdx/J mouse strain were generated and compared with control group. A significant change was observed in the analysis of the heart of dystrophic mice suggesting that this dysfunction affects severely the heart muscle. In blood, the content of K is lower in dystrophic strains as well as Mg and S contents in quadriceps when compared with control group. Other than that, these results may help the researchers to evaluate the efficiency of new treatments and to compare the advantages of different treatment approaches before performing tests in patients with muscular dystrophy.

Log: 278. **A SIMPLIFIED APPROACH TOWARDS OPTIMIZATION OF TIMS EFFICIENCY FOR SAFEGUARDS PURPOSES AT ROKKASHO ON-SITE LABORATORY: MEASUREMENT OF NON-SEPARATED U-PU SAMPLES.**. K. Raptis, G. Duhamel, R. Ludwig, S. Balsley, S. Bürger, V. Mayorov (IAEA), S. Hara, Y. Itoh (NMCC), J. Ninagawa(JSGO).

The Rokkasho Reprocessing Plant (RRP) in Japan is the largest plutonium facility under IAEA safeguards. Following a commissioning period, RRP is expected to go into commercial operation in the near future with a nominal annual throughput of 8000 kg Pu. Several unattended non-destructive analysis instruments are installed in the nuclear material stream at strategic key points of the facility to provide real-time information about material flows and inventory verification. In addition, a dedicated on-site laboratory (OSL) is located on the RRP premises which houses a spectrum of instrumentation needed to independently verify (1) material flow, (2) inventory declarations, (3) the operator’s measurement system, and (4) the facility status. The main instrumentation used at the OSL are hybrid K-edge densitometry, alpha and gamma spectrometry, Pu(VI) spectrophotometry and thermal ionization mass spectrometry (TIMS). At OSL there are two strategic uses of TIMS: (1) to analyse the most important sample types with the highest accuracy and precision, and (2) to serve as a benchmark for equipment calibration and control the performance of other analytical systems. TIMS measurement performance is regularly verified and assessed by a diversity of quality control measures such as quality charting