to point out that, most of the time, solutions for measurement of trace are very dilute, this fact avoiding problems due to quenching and inner filter effect.

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E15

Neutron Activation Analysis: a Powerful Tool for Rare-earth Elements Assay in Terrestrial Materials

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The ability of rare-earth elements to act as indicators of physico-chemical processes in the environment has drawn a great interest on the knowledge of their abundance and distribution. This interest is growing with the availability of reliable data on rare-earth element concentrations.

Neutron activation analysis [1–4] is the most used analytical technique for the determination of the rare-earth elements in environmental matrices on account of its high sensitivity, of the possibility of determining all the elements and of the undisputed accuracy and reliability of its results. Both instrumental and destructive techniques may be applied but when the content of all the rare-earth elements is required, the use of destructive methods is compulsory.

Neutron activation analysis methods for rare-earth elements determination in different matrices have been developed at the University of Pavia using the 250 Kw TRIGA Mark II reactor [5]. In the present paper a critical review of both instrumental and destructive methods is presented as well as the indication of the best working conditions for irradiation, counting and radiochemical separations.

The 'optimized' procedures were then utilized in the determination of rare-earth element in standard reference materials of both mineral and biological origin to emphasize a widespread application of the method. The chosen materials were: SRM-278 'Obsidian rock', SRM-1632 'Coal', SRM-1633 'Fly Ash', SRM-1571 'Orchard Leaves' from U.S. National Bureau of Standard and Standard rock NIM-G (South Africa).

All these matrices were submitted to instrumental and radiochemical activation analysis for rare-earth elements determination.

The choice of the nuclear reaction, irradiation and decay times, and of the proper gamma radiation in counting are presented and discussed. The adopted radiochemical procedure is based on the separation of the rare-earth element group by fluoride precipitation, which allows the removal of ^{46}Sc and alkaline, alkaline-earth radionuclides interfering in the high resolution gamma-ray spectrometry.

Results, given as the average of four or more independent determination and relative standard deviation, are reported and discussed. Precision of the methods can be deduced from the reproducibility of data, whereas accuracy is evaluated by comparison with certified information and literature values. Sensitivity limits under the described operational conditions are also reported. In some cases it is the first time that a rare-earth element content is reported, as for instance Pr, Dy, Ho and Er content in NBS-SRM 278 'Obsidian rock', Pr, Nd, Gd, Er and Tm content in NBS-SRM 1633 'Fly Ash' and Er content in NBS-SRM 1571 'Orchard Leaves'.

Trends and correlations among data are discussed as well.

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E16

Effect of Lanthanium(III) on Noninvasive Tumour Imaging with Gallium-67

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Gallium-67 citrate is the most widely used noninvasive, positive tumour imaging radiopharmaceutical [1]. Healthy organ uptake of the radionuclide in