

DETERMINATION OF k_0 AND Q_0 FOR $^{113}\text{In}(n,\gamma)^{114}\text{In}$ REACTION WITH COVARIANCE ANALYSIS

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The use of k_0 method for quantitative reactor Neutron Activation Analysis (NAA) is a well-known technique for determining multi-element concentrations in different materials. In order to achieve good results, there is a continuing need for improving the accuracy of k_0 and Q_0 parameters for several neutron capture reactions. $^{113}\text{In}(n,\gamma)^{114}\text{In}$ reaction can be considered particularly interesting because k_0 and Q_0 discrepancies appear in the literature. This fact motivated the present work which is focused on the measurement of k_0 and Q_0 values for this reaction with the purpose of improving the existing data catalogues. The irradiations were performed near the core of the IEA-R1 4.5 MW swimming-pool nuclear research reactor of the Nuclear and Energy Research Institute (IPEN-CNEN/SP), in São Paulo, Brazil. The distribution of epithermal neutron flux α in the IEA-R1 is close to zero at the chosen irradiation position, which favors to obtain Q_0 accurately. Two irradiations were carried out in sequence using two sets of samples: the first with a cadmium cover around the samples and the second without. The activity measurements were carried out in an HPGe gamma-ray spectrometer. Standard sources of ^{152}Eu , ^{133}Ba , ^{60}Co and ^{137}Cs supplied by the IAEA were used in order to obtain the HPGe gamma-ray peak efficiency as a function of the energy. The covariance matrix methodology was applied to all uncertainties involved. The final values for k_0 and Q_0 were compared with the literature.

This work was presented at 1st International Conference on Radioanalytical and Nuclear Chemistry – RANC 2016 (poster)

NEUTRON ACTIVATION ANALYSIS OF PHYTOTHERAPICS OF MAYTENUS ILICIFOLIA AND SOLANUM MELONGENA PLANTS

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In Brazil, the consumption of phytotherapics has become very popular due to the vast biodiversity of the immense flora, to the belief that plants that are of natural origin are safe and without side effects. Besides phytotherapics, in general, are cheaper than synthetic products. The objective of this study is to evaluate the elemental concentrations in phytotherapics of the plants *Maytenus ilicifolia*, also known as Holly or "Espinheira Santa", and *Solanum melongena*, known as Eggplant. The