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## Applicability of k<sub>0</sub>-based neutron activation analysis using a Compton suppression γ-ray spectrometer

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Compton suppression system (CSS) in conjunction with  $\gamma$ -ray spectrometer allows to lower the detection limits for certain elements by reducing the background levels in the acquired  $\gamma$ -ray spectra. The calibration of CSS for use in the k<sub>0</sub>-based neutron activation analysis (k<sub>0</sub>-NAA) has been performed in normal mode and applied to Compton suppression mode. In this case, efficiency data are only applied to radionuclides that emit non-coincident  $\gamma$ -rays. In this work the applicability of the k<sub>0</sub>-NAA method using CSS (k<sub>0</sub>-CSNAA) in Compton suppression mode for radionuclides that emit coincident  $\gamma$ -rays is tested. The SMELS (a synthetic multi-element standard) consisting of nuclides with different  $\gamma$ -ray energy and Q<sub>0</sub> values was used to evaluate the Compton suppression factor for several radionuclides of interest, e.g. <sup>60</sup>Co, <sup>51</sup>Cr, <sup>152</sup>Eu, <sup>59</sup>Fe, <sup>75</sup>Se, <sup>46</sup>Sc and <sup>85</sup>Sr. The applicability of k<sub>0</sub>-CSNAA has been tested by analyzing several reference materials, i.e. Coal Fly Ash (NIST-SRM-1633a), Soil (IAEA-Soil-7) and Lichen Material (IAEA-CRM-336). Preliminary results of the test are presented and discussed.

Primary author: Dr HO, Dung Manh (Technological and Nuclear Institute, Sacavem, Portugal)

**Co-authors:** Dr BEASLEY, Daniel (Technological and Nuclear Institute, Sacavem, Portugal); Dr FREITAS, Maria do Carmo (Technological and Nuclear Institute, Sacavem, Portugal); Mr CANHA, Nuno (Technological and Nuclear Institute, Sacavem, Portugal)

Presenter: Dr HO, Dung Manh (Technological and Nuclear Institute, Sacavem, Portugal)

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