

## Abstract

A NaI(Tl)-based gamma spectrometer for the analysis of geological materials was calibrated using the IAEA reference materials RGU-1, RGTH-1 and RGK-1. To simulate typical geological samples, two additional standards were prepared from aliquots of the three reference materials. The reproducibility of the instrument calibration factors (CFs) was tested by repeated measurements of the pure IAEA reference materials and the mixed samples in a reproducible counting geometry. The results were analysed using a two-way classification analysis of variance; it was found that the variance in the CFs is significantly higher between standards than it is between measurements. Allowance should be made for this when estimating uncertainties in measurements with the NaI(Tl) spectrometers.