

Stability of geological reference materials

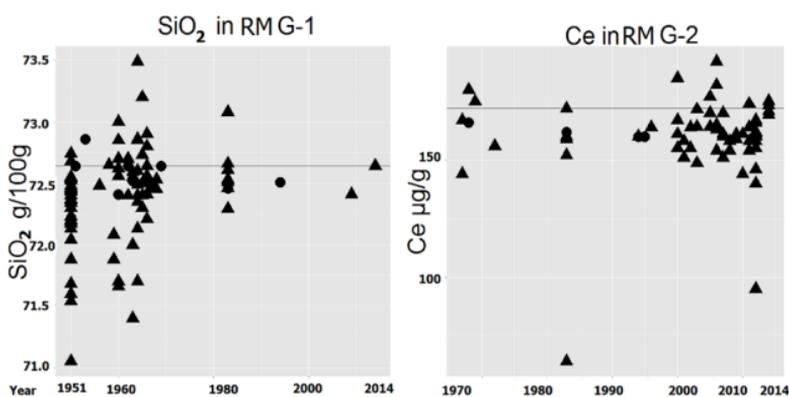
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Stability of certified reference materials is an essential requirement for the meaningful use of certified reference materials for calibration and method validation purposes. For the estimation of the measurement uncertainty budget ISO Guide 35 recommends to quantify the influence of short and long term stability as these are integral part of the property value of a CRM.

Unlike many biological materials, geological materials are assumed to be stable over not only years but decades. We are able to prove the hypothesis of long-term stability of geological RM by reanalyzing, compiling and comparing the mass fraction measurand data published in 1951, based on classical methods [1] for exactly the same RM G-1 and W-1 which was originally distributed in 1950s for proficiency testing schemes. Methods with high precision which are able to differentiate degradations (gain or loss) in measurands contents and uncertainties caused during measurement process are required. In reality the precisions of the methods did improve since the early fifties once XRF method were preferred over gravimetry or titrimetry but the variance of interlaboratory comparisons did not greatly decrease even through advancement of analytical technique [2]. As no data exists that was produced by one lab with the same analytical technique since 1950, a direct study is not possible. New data derived from XRF and ICP-MS measurements for G-1, G-2 as well as W-1 and W-2 were added to gathered data to demonstrate that no changes in the SiO_2 and Ce mass fraction has occurred over 60 years.



[1]. H.W. Fairbairn, W.G. Schlecht, R.E. Stevens, W.H. Dennen, L.H. Ahrens and F. Chayes (1951) *Bull. U. S. Geol. Surv.* **980** 71 p. [2]. T. Meisel and J.S. Kane (2011) , *ACCREDIT QUAL ASSUR*, **16** 407-414