Geophysical Research Abstracts
Vol. 20, EGU2018-12246, 2018
EGU General Assembly 2018

Evaluation on Uncertainty of Geological Samples' Analytical Results by Polarized Energy Dispersive X-Ray Fluorescence Spectrometry with pressed pellets

Yiya Wang (1) and Xiuchun Zhan (1)

(1) National Research Center for Geoanalysis , Beijing,China (yiyawang@163.com), (2) National Research Center for Geoanalysis , Beijing,China (zhanxiuchun2012@126.com)

Uncertainty evaluation is required to be reported with analytical results in a complete analytical report in geoanalysis, in which analytical results of every kind of method can be compared. Uncertainty has no connection with results, only express the dispersion of measured values in a special method, and the uncertainty components include some sources such as those caused by sample preparation, measurement process and analytical procedure, et al. The mode evaluating uncertainty of analytical results with 165 geological samples has been reported according to the internationally accepted guidelines. 165 pressed pellets of a lot of similar matrix geological samples with reliable values were analyzed by polarized dispersive X-Ray Fluorescence Spectrometry. These samples were divided into several different concentration sections following the concentration ranges of every component. The relative uncertainties caused by precision and accuracy of 27 components were evaluated respectively. According to the error propagation theory, combine the precision uncertainty and the accuracy uncertainty into a global uncertainty, this global uncertainty was acted as method uncertainty. This mode of evaluating uncertainty can solve a series of difficult questions in the process of evaluating uncertainty, such as uncertainties caused by complex matrix of geological samples, calibration procedure, standard samples, unknown samples, matrix correction, overlap correction, sample preparation, instrument condition and mathematics model. However, this model used a lot of samples which cannot simply apply to other types of samples with different matrix samples. The number of samples is too many to adapt to other type's samples. This difficult question was expected to be solved using a kind of reasonable mode of mathematics statistics to obtain consistent analytical results.