

## **X-ray Fluorescence Analysis of Round Robin Samples: Andesite, MGL-AND and Ordinary Portland Cement, OPC-1**

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Over the past 15 years, the X-ray Fluorescence Laboratory at the Savannah River National Laboratory has participated in an International Proficiency Testing Program under the direction of The Open University, UK for the elemental analysis of various geological materials. In 2010, two geological samples, andesite and ordinary portland cement, were received and analyzed. The andesite was supplied by Dr. B. Bartjargal of the Central Geological Laboratory in Mongolia, and the ordinary Portland cement was provided by PPC Cement, RSA under the direction of Dr. M. Loubser. Both these materials were tested for grain size and compositional homogeneity by x-ray fluorescence at The Open University before distribution.

The participation is truly international and represents the premier geochemical laboratories in the world, including major national (e.g. U.S. Geological Survey, British Geological Survey, and the Geological Survey of Denmark) and university (e.g. Technical University of Berlin, Germany and Institute of Geochemistry, Russia) geochemical laboratories. These laboratories are required to analyze the sample using established techniques following routine procedures and analytical conditions. Contributed data are then compared with assigned values and a performance score (z-score) is calculated for each analytical result submitted by each laboratory. An evaluation of these scores allows each contributing laboratory to assess their analytical results and investigate discrepancies, if appropriate. There are two performance standards, Data Quality 1 and Data Quality 2, against which the user can have their analytical results judged. Our laboratory selects Data Quality 2, which is for laboratories working to an applied geochemistry standard of performance where the main objective is to provide results on large number of samples, but accuracy and precision is still important. The z-scores for the two samples, andesite and ordinary portland cement, range from -0.25 to 0.24 and -0.20 to 1.01 respectively for all the elements which were analyzed and assigned firm values. Since the z-scores for both samples are in the acceptable range of -2 to 2, no actions are required to examine sample preparation procedures. The results of the two round robin samples will be presented.