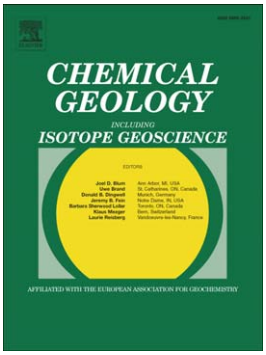

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Application of a handheld X-ray fluorescence spectrometer for real-time, high-density quantitative analysis of drilled igneous rocks and sediments during IODP Expedition 352

J.G. Ryan[1], J.W. Shervais[2], Y. Li[3], M.K. Reagan[4], H.Y. Li[5], D. Heaton[6], M. Godard[7], M. Kirchenbaur[8], S. Whattam[9], J.A. Pearce[10], T. Chapman[11], W. Nelson[12], J. Prytulak[13], K. Shimizu[14], K. Petronotis[15], and the IODP Expedition 352 Scientific Team[16]

[1]{School of Geosciences, University of South Florida, Tampa, FL, USA}
[2]{Geology, Utah State University, USA}
[3]{Institute of Geology, Chinese Academy of Geological Sciences, Beijing, China}
[4]{Dept. Earth and Environmental Sciences, University of Iowa, Iowa City, USA}
[5]{State Key Laboratory of Isotope Geochemistry, Guangzhou Institute of Geochemistry, Chinese Academy Science, Guangzhou 510640, China}
[6]{College of Earth, Ocean and Atmospheric Sciences, Oregon State Univ., Corvallis, OR}
[7]{Geosciences, Universite Montpellier II, Montpellier, France}
[8]{Geologische Inst., Universitat Koln, Koln, Germany}
[9]{Dept. Earth and Environmental Sciences, Korea University, Republic of Korea}
[10]{Earth and Ocean Sciences, Cardiff University, UK}
[11]{School of Geosciences, University of Sydney, Australia}
[12]{Physics, Astronomy, Geosciences; Towson University, MD, USA}
[13]{Earth Sciences and Engineering, Imperial College, UK}
[14]{International Ocean Discovery Program, College Station, TX, USA}
[15] {Kochi Core Center, Kochi University, Japan}
[16]{R. Almeev, A. Avery, C. Carvallo, G. Christeson, E. Ferre, W. Kurz, S. Kutterolf, K. Michibayashi, S. Morgan, M. Python A. Robertson, W. Sager, T. Sakuyama; see http://iodp.tamu.edu/scienceops/precruise/izuboninforearc/participants.html for affiliations}

Correspondence to: J. G. Ryan (ryan@mail.usf.edu)

Abstract

Handheld energy dispersive portable X-ray spectrometers (pXRF) are generally designed and used for qualitative survey applications. We developed shipboard quantitative analysis protocols for pXRF and employed the instrument to make over 2000 individual abundance measurements for a selection of major and trace elements on over 1200 meters of recovered core during the eight weeks of the International Ocean Discovery Program (IODP) Expedition 352 to the Izu-Bonin forearc. pXRF analytical performance, accuracy and precision were found to be the same on powdered rock samples and on freshly cut rock surfaces, and sample