

Elements

An International Magazine of Mineralogy, Geochemistry, and Petrology

Volume 9, Number 1 • February 2013

One Hundred Years of Geochronology

Guest Editors: Daniel J. Condon and Mark D. Schmitz



One Hundred Years of Isotope Geochronology, and Counting

Daniel J. Condon and Mark D. Schmitz



Precision and Accuracy in Geochronology

Blair Schoene, Daniel J. Condon, Leah Morgan, and Noah McLean



High-Precision Geochronology

Mark D. Schmitz and Klaudia F. Kuiper



High-Spatial-Resolution Geochronology

Alexander A. Nemchin, Matthew S. A. Horstwood, and Martin J. Whitehouse



Dating the Oldest Rocks and Minerals in the Solar System

Yuri Amelin and Trevor R. Ireland



Time Constraints and Tie-Points in the Quaternary Period

David A. Richards and Morten B. Andersen



Revolution and Evolution: 100 Years of U-Pb Geochronology

James M. Mattinson

ABOUT THE COVER:
Zircon is among the premier geochronometers described in this issue. Illustrated is a Nomarski contrast image of an acid-etched zircon from a 4.03 Ga tonalite of the Acasta gneiss complex, Canada, with ion probe analysis craters labeled in millions of years (IMAGE COURTESY OF SAMUEL A. BOWRING AND IAN S. WILLIAMS). The background image shows zircon crystals on matrix from the Kola Peninsula (© MORGENTJERNE | DREAMSTIME.COM).

Elements is published jointly by the Mineralogical Society of America, the Mineralogical Society of Great Britain and Ireland, the Mineralogical Association of Canada, the Geochemical Society, The Clay Minerals Society, the European Association of Geochemistry, the International Association of Geochemistry, the Société Française de Minéralogie et de Cristallographie, the Association of Applied Geochemists, the Deutsche Mineralogische Gesellschaft, the Società Italiana di Mineralogia e Petrologia, the International Association of Geoanalysts, the Polskie Towarzystwo Mineralogiczne (Mineralogical Society of Poland), the Sociedad Española de Mineralogía, the Swiss Society of Mineralogy and Petrology, the Meteoritical Society, and the Japan Association of Mineralogical Sciences. It is provided as a benefit to members of these societies.

Elements is published six times a year. Individuals are encouraged to join any one of the participating societies to receive *Elements*. Institutional subscribers to any of the following journals—*American Mineralogist*, *Clay Minerals*, *Clays and Clay Minerals*, *Mineralogical Magazine*, and *The Canadian Mineralogist*—also receive one copy of *Elements* as part of their 2013 subscription. Institutional subscriptions are available for US\$160 (US\$175 non-US addresses) a year in 2013. Contact the managing editor (tremblpi@ete.inrs.ca) for information.

Copyright 2013 by the Mineralogical Society of America

All rights reserved. Reproduction in any form, including translation to other languages, or by any means—graphic, electronic, or mechanical, including photocopying or information storage and retrieval systems—without written permission from the copyright holder is strictly prohibited.

Publications mail agreement no. 40037944

Printed in USA

ISSN 1811-5209 (print)

ISSN 1811-5217 (online)

www.elementsmagazine.org

www.elements.geoscienceworld.org

GeoScienceWorld
Participating Publisher



DEPARTMENTS

Editorial – The Age of the Earth	3
From the Editors – Introducing Patricia Dove	4
People in the News – Berner, Schopf, AGU Fellows	6
Elements Toolkit – Field-Portable XRF	7
Meet the Authors	12
Society News	
Association of Applied Geochemists	58
The Clay Minerals Society	59
International Association of Geochemistry	60
International Association of Geoanalysts	61
Japan Association of Mineralogical Sciences	62
Meteoritical Society	63
Mineralogical Society of Great Britain and Ireland	64
Mineralogical Society of America	66
Geochemical Society	68
Société Française de Minéralogie et de Cristallographie	69
Mineralogical Association of Canada	70
European Association of Geochemistry	72
Società Italiana di Mineralogia e Petrologia	74
Association Internationale pour l'Étude des Argiles	75
Book Review – <i>Quantitative Mineralogy and Microanalysis in Sediments and Sedimentary Rocks</i>	76
Calendar	77
Parting Shots – A Record Brimful of Promise	79
Advertisers in This Issue	80