

# Geochemistry

EXPLORATION, ENVIRONMENT,  
ANALYSIS

*Editor:* **G. E. M. Hall**, Geological Survey of Canada, Ottawa, Canada (e-mail: GHall@NRCan.gc.ca)

*Associate Editors:* **M. Leybourne** (GNS Science, New Zealand), **J. Carranza** (ITC, The Netherlands)

*Production Editor:* **Jessica Pollitt**, Geological Society Publishing House, Bath, UK (e-mail: jessica.pollitt@geolsoc.org.uk)

The journal is abstracted and/or indexed in *AGI's Bibliography and Index of Geology, Chemical Abstracts, Current Contents, Engineering Index, GEOBASE, GeoRef, Mineralogical Abstracts, PASCAL/CNRS, GeoArchive, Thomson ISI database (SCIE, CC/PC & ES)*

## CONTENTS - Volume 10, No. 4

### Determining the magnitude of true analytical error in geochemical analysis

C. R. Stanley, N. O'Driscoll & P. Ranjan 355

### Catchment basin modelling of stream sediment anomalies revisited: incorporation of EDA and fractal analysis

E. J. M. Carranza 365

### The characteristics of rare earth elements in bulk precipitation, throughfall, foliage and lichens in the Lesní potok catchment and its vicinity, Czech Republic

J. Špičková, T. Navrátil, J. Rohovec, M. Mihaljevič, P. Kubínová, L. Minařík & P. Skřivan 383

### Heavy mineral dispersal trains in till in the area of the Lac des Iles PGE deposit, northwestern Ontario, Canada

P. J. Barnett & S. Averill 391

### Use of termitaria in surficial geochemical surveys: evidence for >125- $\mu$ m size fractions as the appropriate media for gold exploration in northern Ghana

E. Arhin & P. M. Nude 401

### Effects of pH, adsorbate/adsorbent ratio, temperature and ionic strength on the adsorption of arsenate onto soil

M.-J. Kim 407

### A comparative copper isotope study of porphyry copper deposits in Iran

H. Mirnejad, R. Mathur, M. Einali, M. Dendas & S. Alirezaei 413

### Distribution of potentially toxic metal and radionuclide contamination in soils related to phosphogypsum waste stockpiling in the Eshidiya Mine, Jordan

M. S. Al-Hwaiti & J. F. Ranville 419

*Geochemistry: Exploration, Environment, Analysis* (ISSN 1467-7873) is published in February, May, August and November by the Geological Society Publishing House for the Geological Society, London and the Association of Applied Geochemists.

**Subscription rates 2010 (volume 10, 4 parts):** All correspondence relating to trade subscriptions should be addressed to the Journal Subscriptions Department, Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath, UK, BA1 3JN (Tel: +44 (0) 1225 445046; Fax: +44 (0) 1225 442836; e-mail: sales@geolsoc.org.uk). The subscription prices for 2010 to institutions and non-fellows are GEEA Online: £199 +VAT (UK), £225/US\$450 (overseas) or GEEA Online+print: £209 +VAT (UK), £236/US\$473 (overseas). The current tax rates (for UK and European Union subscribers) and more information can be found on <http://www.geolsoc.org.uk/LyellCollection>.

Periodical postage paid at Middlesex, N.J. *Postmaster:* send address changes to *Geochemistry: Exploration, Environment, Analysis*. The Geological Society, c/o Pronto Mailers, PO Box 177, Middlesex, NJ 08846.

© 2010 The Geological Society of London and AAG. Except as otherwise permitted under the Copyright, Designs and Patents Acts, 1988, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency Ltd, Saffron House, 6–10 Kirby Street, London EC1N 8TS, UK. Enquiries concerning reproduction outside these terms should be sent to the Publishers at the Bath address. Users registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA: The item-fee code for this journal is 1467-7873/10/\$15.00.

The Geological Society and AAG make no representation, express or implied, with regard to the accuracy of the information contained in this publication and cannot accept any legal responsibility for any errors or omissions that may be made.

*Cover illustration:* Airborne hyperspectral (Hymap) image showing hydrothermal alteration associated with high-sulfidation epithermal gold mineralization near Rodalquilar, Almeria province, Spain. Red: Intense alteration, alunite and kaolinite; Green: Alteration, illite; Blue: Unaltered volcanic and sedimentary rock. Viewing direction is east. Width of floodplain approximately 500 m. Vertical exaggeration is 2. Pixel size of the image: 4×4 m. Map produced by F. van Ruitenbeek, ITC, The Netherlands.

# GSW GeoScienceWorld



Explore deeper, faster

## We've Grown!

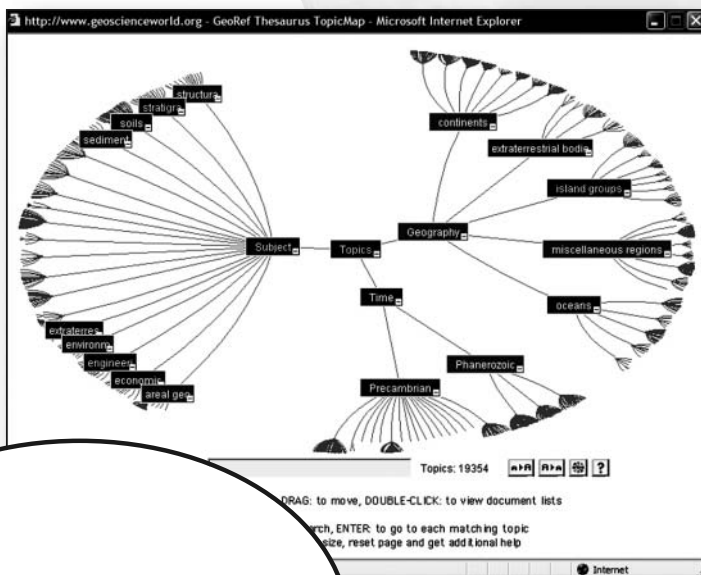
GSW's online service, the *GSW Millennium Collection*, includes peer-reviewed articles and other materials with linked reference lists from over 30 high-impact journals in a broad range of geoscience areas. The digital collection is updated continuously with the most current journal issues. All journals have a minimum of one back year, and most in the database start with the year 2000. A Literature Archive of pre-2000 articles enhances the *Millennium Collection*.

Readers may sign-up for free e-mail alerts for the contents of their favorite journals and results of saved search parameters. Extensive reference linking enables researchers to readily trace their way through the literature.

For information about subscribing, please visit:  
[www.geoscienceworld.org/subscriptions/subscribe.dtl](http://www.geoscienceworld.org/subscriptions/subscribe.dtl)



The GSW home page, showing a reader's favorite journals list



Visually browse the *GeoRef Thesaurus* using the TopicMap.

## GeoRef

A primary strength of GSW is the ability to search full text in a linked collection. GSW is also integrated with GeoRef, the premier abstracting and indexing database in our field. GSW's fully-searchable version of GeoRef is updated weekly, making it the most current version of GeoRef available anywhere.

GeoRef searching includes authors and their affiliations, titles, keywords, meeting information, publication date, language, and document types.

## Unique features

Users may search using geographic coordinates, entering boundaries for latitude and longitude for an area of interest.

← A data-visualization tool called the TopicMap provides a graphical interface for browsing the *GeoRef Thesaurus*.

**30-day free trials available**  
**Check it out at: [www.geoscienceworld.org](http://www.geoscienceworld.org)**