Table of contents

Keynote lectures

Stable isotope exchange in fluid-mineral systems: Old problems, new solutions 861
J.R.O'Neil

Saline formation waters in sedimentary basins: Connate or diagenetic? 865
Lynton S.Lard

Early diagenesis in sediments: A global view? 869
Max L.Coleman

The composition of gases in geothermal and volcanic systems as a function of tectonic setting 873
W.F.Giggenbach

Ore deposits in the Oquirrh and Wasatch Mountains, Utah: Examples of large-scale water-rock interaction 879
M.T.Einaudi

Results of water rock interactions in mid-ocean ridges 885
J.M.Edmond

Stable and radioactive isotopes

Water and solutes

Boron isotopic composition of Icelandic hydrothermal systems 893
J.K.Aggarwal, M.R.Palmer & K.V.Ragnarsdottir

Isotopic composition of Sr, Nd and Li in thermal waters from the Norris-Mammoth corridor, Yellowstone National Park and surrounding region 897
T.D.Bullen & Y.K.Kharaka

Combined noble gas and quadrupole mass spectrometer analysis of volatiles trapped in fluid inclusions 903
P.Burnard, L.Ayliffe, F.Stuart, G.Turner & C.Curtis
The signature of water-rock interactions in the formation waters of sedimentary basins: Some new evidence
Sam Chaudhuri, S. Furlan & N. Clauer

Stable isotopes in volcanic fluids and rocks at Vulcano (Sicily, Italy)
G. Cortecci, G. Ferrara, A. Maiorani & B. Turi

Unconventional stable isotopes: Iron

Mantle derived helium in fluid inclusions of a 2.5 Ga old granulite, Nilgiri Hills, Southern India
T. J. Dunai, J. R. L. Touret & I. M. Villa

Noble gas geochemistry of mineralization in the Pennines
Jacqueline L. Ford, Finlay M. Stuart & Grenville Turner

Geochemical modelling of Sr isotopic signatures in the interaction between granitic rocks and natural solutions
B. Fritz, L. Richard & R. H. McNutt

Chlorine-36 in groundwaters in the Lac du Bonnet granite, southeastern Manitoba, Canada
M. Gascoyne, D. C. Kamineni & J. Fabryka-Martin

An oxygen isotope study of silicates at Larderello, Italy
P. Iacumin, E. Petrucci, G. Gianelli & M. Puxeddu

Oxygen isotope studies of hydrothermally altered basalts from Surtsey, Iceland
H. R. Karlsson, S. J. Jakobsson & J. G. Moore

Chlorine stable isotope distribution of Michigan Basin and Canadian Shield formation waters
Ronald S. Kaufmann, S. K. Frape, Robert McNutt & Christopher Eastoe

Anomalous $^3$He contents of CH$_4$-rich gases in sedimentary basins
B. Mack Kennedy, J. Poths & H. Hiyagon

Changes of stable isotopes and chemistry of fluids in the low-temperature geothermal field at Bakki-Thórozdstadir, Ólfus, SW-Iceland
Hrefna Kristmannsdóttir & Árný Erla Sveinbjörnsdóttir

Stable isotope studies of diagenesis in berthierine-bearing oil sands, Clearwater Formation, Alberta, Canada
F. J. Longstaffe, A. Ayalon & M. A. Racki

Mantle helium signal in the compressed feature, Outer Carpathians, Poland
P. M. Leśniak, H. Sakai, J. Ishibashi & H. Wakita

Chemical composition and stable isotopes of thermal waters, Norris-Mammoth corridor, Yellowstone National Park, USA
R. H. Mariner, Y. K. Kharaka, Gil Ambats & L. D. White

Hydrogen isotopic ratio of hornblende from Quaternary volcanic rocks in Japan
Osamu Matsubaya & Isoji Miyagi

Lead and strontium isotopic data on brines from the Michigan basin, Ontario and Michigan
C. M. McKenna, R. H. McNutt & S. K. Frape
The sulphur isotopic composition of mafic-intermediate volcanic rocks, Taupo Volcanic Zone, New Zealand
B.W. Robinson & I.J. Graham

The McLaughlin hot-spring gold-mercury deposit and its relationship to hydrothermal systems in the Coast Ranges of northern California, USA
R.L. Sherlock & E.C. Jowett

$^{10}$Be and $^9$Be in the Salton Sea (USA) and other geothermal systems
Nathalie J. Valette-Silver, Fouad Tera & Milan Pavich

Exchange reactions
Isotope-geochemical effects of water-rock interactions in the Atesina-Cima d’Asta volcano-plutonic complex, Italy
S. Barth, F. Oberli, M. Meier, P. Blattner, G. M. Bargossi & G. Di Battistini

Possible evidence for fluid-rock oxygen isotope disequilibrium in hydrothermal systems
David R. Cole

The effects of dissolved salts on oxygen and hydrogen isotope fractionation between water vapor and brines at 50-100°C
J. Horita, D.J. Wesolowski & D.R. Cole

The effect of pressure on equilibrium isotope fractionation
N. N. Kharlashina & V.B. Polyakov

Boron isotopic fractionation between coexisting vapor and liquid in natural geothermal systems
William P. Leeman, Robert D. Vocke & Mike A. McKibben

Geochemical modeling

Solution chemistry and thermodynamics
Experimental study of aluminum hydrolysis and complexation with acetate and sodium ions in hydrothermal solutions
S. Castet, J.L. Dandurand, J. Schott & R. Gout

Solubility of Pt, Pd sulfides and Au in aqueous bisulfide solutions to 350°C
Pujing Pan & Scott A. Wood

Calculation of the thermodynamic properties of mononuclear aqueous Al species in the system Al$_2$O$_3$-H$_2$O-NaCl at temperatures to 1000°C and pressures to 5 kb
Vitalii A. Pokrovskii & Harold C. Helgeson

Excess molar volumes for CO$_2$-CH$_4$-N$_2$ mixtures

Calculation of the solubility of minerals in H$_2$O-CO$_2$ solutions at mid and lower crustal depths
John V. Walther
Thermodynamic modeling of Be-mineralization: Preliminary calculations
Maria Woitsekhovskaya

Solute transport

The natural evolution of geothermal systems in light of infiltration fronts and a look back at fluid-to-rock ratios
Peter Blattner & Keith R. Lassey

Lattice gas automata for flow and transport in geochemical systems
D.R. Janecky, S. Chen, S. Dawson, K.C. Eggert & B.J. Travis

CIRF: A general reaction-transport code: Mineralization fronts due to the infiltration of reactive fluids
J.L. Potdevin, W. Chen, A. Park, Y. Chen & P. Ortoleva

Dissolved salt removal from Illinois Basin waters
V. Ranganathan

Mechano-chemistry of compartmented basins
E.L. Sonnenthal, J.M. Maxwell, C. Qin & P.J. Ortoleva

General applications

A quantitative first principles approach to supergene enrichment of a porphyry copper protore
Giuseppe G. Biino & Peter C. Lichtner

Thermodynamic modelling of geochemical processes: The CSIRO-Monash THERMOCHEMISTRY System
M.S. Bloom, M.W. Wadsley & Y. Gu

Thermodynamic model of interaction between sulphides and oxidizing solutions with special attention to intermediate conditions
G.R. Kolonin & O.L. Gas’kova

Aluminium – catalyst, crystal deformer, and dye: Self-organizational crystallization of quartz in agates and amethyst geodes, Paraná flood basalts, Brazil
Enrique Merino, Yifeng Wang & Etienne Deloule

Integration of intensive variable diagrams and fluid phase equilibrium with SOLMINEQ.88 pc/shell
E.H. Perkins

Collapse of acid waters into boiling hydrothermal system and the origin of late stage pyrite and related kaolinite
Mark H. Reed & Geoff Plumlee

Microcomputer-based modeling of speciation and water-mineral-gas reactions using programs SOLVEQ and CHILLER
N.F. Spycher & M.H. Reed

Reaction path modelling of diagenesis in the Eocene Wilcox Group of the Texas Gulf Coast
R.N. Tempel & W.J. Harrison
Analysis of heat source for the Xiangshan fossil hydrothermal system, China: A modeling approach
Zhou Wenbin

Sedimentary basins

Fluid evolution

Regional hydrogeology and fluid geochemistry of the Mannville Group, Western Canada
H.J.Abercrombie & E.G.Fullmer

Preservation of ancient basinal fluids in halite fluid inclusions
D.Chipley & T.K.Kyser

Water composition variation within one formation
Max L.Coleman

The effects of combined changes in pore fluid chemistry and stress state on reservoir permeability: Design and recirculating flow rig
S.C.Elphick, G.B.Shimnield, B.T.Ngwenya, I.G.Main, B.G.D.Smart & B.R.Crawford

Chemical composition and origin of saline formation waters from the Konrad Mine, Germany
H.Klinge, P.Vogel & K.Schelkes

Geochemical modeling of salt dome cap rock-brine reactions
James A.Saunders

Contrasts between steam stimulation and in-situ combustion process: An analysis of co-produced fluid compositional data
Maurice Shevalier, Ian Hutcheon, Cynthia Nahnybida & Hugh Abercrombie

Spatial variations in North Sea formation water compositions: Preliminary results
E.A.Warren & P.C.Smalley

Mixing of groundwater with isotopically distinct signatures: A multi-component mixing model for the Dundee Formation of southwestern Ontario, Canada
T.R.Weaver, S.K.Frape & J.A.Cherry

Halogen compositions of fluid inclusions as tracers of crustal fluid behaviour
B.W.D.Yardley, D.A.Banks & I.A.Munz

Hydrogeochemical patterns of major stages of the sedimentary process
V.P.Zverev

Mineral diagenesis

North Sea clastic diagenesis and formation water constraints
P.Aagaard, P.Kr.Egeberg & J.S.Jahren

Cementation of North Sea sands: Constraints from fluid compositions
Andrew C.Aplin, Edward A.Warren & Shona M.Grant
Silica mass transport during shale diagenesis: Are shales a source or sink for silica?  
J.Bloch & I.E.Hutcheon  

Overpressure release, cross-formational porewater flow and diagenesis  
Patrice de Caritat & Julian C. Baker  

Three zones for burial metamorphism  
D.D.Eberl  

Secondary K-feldspar at the Precambrian-Paleozoic boundary, Ontario, Canada  
D.A.Harper, F.I.Longstaffe & M.A.Wadleigh  

Illite/smectite diagenesis in overpressured and normally pressured environments, Beaufort-Mackenzie Basin, Arctic Canada  
J.Ko & R.Hesse  

Isotopic, mineralogic and chemical evidence for multiple episodes of fluid movement during prograde and retrograde diagenesis in a Proterozoic basin  
T.G.Kotzer & T.K.Kyser  

The mechanism of porosity reduction, styolite development and quartz cementation in North Sea sandstones  
E.H.Oelkers, P.A.Bjorkum, & W.M.Murphy  

Mathematical simulation of water-mineral interaction and fluid flow with respect to the diagenetic evolution of sandstones  
R.Ondrak  

Experimental studies of mudstone diagenesis  
Elspeth I.C.Rae & David A.C.Manning  

Small scale trace element zonations in carbonates: An ion microprobe study of diagenesis in the Upper Devonian Nisku Formation, Western Canada Sedimentary Basin  

Coupled predictive models of diagenesis in sand-shale successions during progressive burial  
R.C.Surdam & D.B.MacGowan  

A model for diagenesis in the Upper Wilcox reservoir sandstones at Fandango Field, south Texas, USA  
Glenn A.Wilson, Charles E.Harvie & David T.Lawrence  

Evolution of CaCl₂ brine in Silurian aged formations of the Michigan basin, USA: The role of mineralogic reactions and evaporite diagenesis  
T.P.Wilson & D.T.Long  

Mineral transformations and interactions  

Constraints for an evaporitic sedimentation modeling: Microanalysis of frozen fluid inclusions in halite  
A.Canals, B.Carpentier, A.Y.Huc & B.Durand  

Computer modelling of steam flood experiments  
Jon S.Dudley & Craig H.Moore
A stable isotope study of clay minerals from the Sancerre-Couy deep drill hole, Paris Basin, France
*A.M. Fouillac & D. Beaufort*

Experimental study of reactions between selected clays and micas and aqueous fluid analogues of well-bore engineering fluids
*C.R. Hughes & P.I. Hill*

Hydrodynamic and chemical controls of Paleozoic phosphorite and barite in the western Cordillera of North America
*P.W. Jewell*

Access of pore waters to carbonate precipitation sites during concretion growth
*M.M. Jordan, A.C. Aplin, C.D. Curtis & M.L. Coleman*

Wettability of petroleum reservoir rock minerals
*H. Lemke & K. Schwochau*

Replacement of albite by K-feldspar and vice versa
*Radomir Petrovich & Philip M. Orville*

Wettability of petroleum reservoir rock minerals
*H. Lemke & K. Schwochau*

Replacement of albite by K-feldspar and vice versa
*Radomir Petrovich & Philip M. Orville*

Illite age analysis, a new tool for basin thermal history analysis
*D.R. Pevear*

Geothermal systems

Fluid chemistry

The occurrence of acidic fluids in the Leirbotnar field, Krafla, Iceland
*Halldór Ármannsson & Gestur Gíslason*

Hydrochemistry of Olkaria and Eburru geothermal fields, Kenyan Rift Valley
*M.K. Arusei*

Geochemistry of waters from three geothermal boreholes in the upper Rhein graben, Switzerland
*L. Calmbach*

Thermal springs in the Precambrian crystallines of the western continental margin of India: Field and experimental results
*D. Chandrasekhar, A. Ramanathan & R.L. Selvakumar*

Gas geochemistry for the Beppu hydrothermal system, Kyushu, Japan
*F.D. Amore, G. Gianelli, A. Caprai, Y. Yusa, K. Kitaoka & K. Takemura*

Thermal waters and mineralization in the Geysers-Clear Lake area, California, USA
*Julie M. Donnelly-Nolan*
<table>
<thead>
<tr>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Salton Sea Hydrothermal System, California, USA: A review</td>
<td>1283</td>
</tr>
<tr>
<td>W.A. Elders, M.A. McKibben &amp; A.E. Williams</td>
<td></td>
</tr>
<tr>
<td>The geochemistry of hot spring waters at Norris Geyser Basin, Yellowstone National Park, USA</td>
<td>1289</td>
</tr>
<tr>
<td>Robert O. Fournier, J. Michael Thompson &amp; Roderick A. Hutchinson</td>
<td></td>
</tr>
<tr>
<td>Exploration progress of high enthalpy geothermal prospects in Indonesia</td>
<td>1293</td>
</tr>
<tr>
<td>Sugiarto Ganda, Djoko Sunaryo &amp; Tanda Tampubolon</td>
<td></td>
</tr>
<tr>
<td>Hydrothermal systems of Hengduan Mountains, China</td>
<td>1297</td>
</tr>
<tr>
<td>Guo Guoying</td>
<td></td>
</tr>
<tr>
<td>Composition of gases from the Norris-Mammoth corridor, Yellowstone National Park, USA:</td>
<td>1303</td>
</tr>
<tr>
<td>Evidence for a magmatic source near Mammoth Hot Springs</td>
<td></td>
</tr>
<tr>
<td>Y.K. Kharaka, R.H. Mariner, W.C. Evans &amp; B.M. Kennedy</td>
<td></td>
</tr>
<tr>
<td>The origin of thermal waters in crystalline rocks of the North China fault block</td>
<td>1309</td>
</tr>
<tr>
<td>Li Guiru, Wang Jihua, Zhang Peiren &amp; Jiang Fengliang</td>
<td></td>
</tr>
<tr>
<td>Genesis of mineral waters of the Rhenish Massif, central Europe</td>
<td>1313</td>
</tr>
<tr>
<td>Franz May, Stephan Hoernes &amp; Horst J. Neugebauer</td>
<td></td>
</tr>
<tr>
<td>Environmental isotope study of saline geothermal systems in western Anatolia, Canakkale, Turkey</td>
<td>1317</td>
</tr>
<tr>
<td>Stefan Mützenberg, Werner Balderer &amp; Werner Rauert</td>
<td></td>
</tr>
<tr>
<td>Trace element geochemistry of the system ‘rock – thermal water – suspended matter – deposits’ in a granitic environment</td>
<td>1321</td>
</tr>
<tr>
<td>Elka N. Pentcheva, Els Veldeman, Luc Van’t dack &amp; Renaat Gijbels</td>
<td></td>
</tr>
<tr>
<td>Thermal springs in granitic rocks from the Grimsel Pass (Swiss Alps): The late stage of a hydrothermal system related to Alpine Orogeny</td>
<td>1327</td>
</tr>
<tr>
<td>H.-R. Pfeifer, A. Sanchez &amp; C. Degueldre</td>
<td></td>
</tr>
<tr>
<td>Thermal waters in México</td>
<td>1333</td>
</tr>
<tr>
<td>R.M. Prol-Ledesma</td>
<td></td>
</tr>
<tr>
<td>REE distribution in calcites from the Lisbon volcanic complex, Portugal</td>
<td>1337</td>
</tr>
<tr>
<td>M.I. Prudêncio, J.M.P. Cabral &amp; M.A. Sequeira Braga</td>
<td></td>
</tr>
<tr>
<td>Petrology and fluid chemistry of magmatic-hydrothermal systems in the Philippines</td>
<td>1341</td>
</tr>
<tr>
<td>A.G. Reyes &amp; W.F. Giggenbach</td>
<td></td>
</tr>
<tr>
<td>The question of recharge to the geysers and hot springs of Yellowstone National Park, Wyoming, USA</td>
<td>1345</td>
</tr>
<tr>
<td>Robert O. Rye &amp; Alfred H. Truesdell</td>
<td></td>
</tr>
<tr>
<td>Secondary effects of reinjection on the Larderello, Italy geothermal system evaluated by the study of the isotopic and chemical composition of the gas mixtures</td>
<td>1349</td>
</tr>
<tr>
<td>G. Scandiffio, F. Baccarin, M. Valenti, C. Panichi, P. Noto &amp; L. Bellucci</td>
<td></td>
</tr>
<tr>
<td>Inactive gas ratios of geothermal gases from the Sengan field, Northeast Japan, and their implications in origins of hydrothermal systems</td>
<td>1353</td>
</tr>
<tr>
<td>H. Shigeno, M. Takahashi &amp; T. Noda</td>
<td></td>
</tr>
</tbody>
</table>
A conceptual model of the hydrothermal system in Long Valley caldera, California, USA  
Michael L. Sorey & Christopher D. Farrar

Temporal changes in mud volcanos, Salton Sea Geothermal Area  
A.A. Sturz, R. L. Kamps & P. J. Earley

Carbon stable isotope geochemistry of a geothermal system: Los Azufres, Mexico  
Mahendra P. Verma, Enrique Portugal & David Nieva

Geothermal systems in continental area of China  
Wang Ji-yang, Chen Moxing, Xiong Liang-ping & Pang Zhong-he

Determination of cation exchange parameters for a hot dry rock geothermal energy reservoir  

The rare-alkali metal characteristics of Tibetan geothermal systems and the potential for exploitation and utilization  
Zheng Yaxin

Mineral interactions

Calcite deposition in geothermal wells caused by infiltrating seawater  
Stefán Arnórsson

An autoclave reinjection study of a vitreous rhyolite tuff  
Cheng Yan, A.C. Lee, V.J. Grassi, D.E. Grandstaff & Gene C. Ulmer

Experimental approach to the self-sealing of rock-water systems  
Masahiro Chigira & Masakazu Watanabe

Travertines deposited by CO$_2$-rich springs in the geothermal province of northern Latium, Italy  
G. Chiodini, A.R. Zanzari & L. Fanfani

Alteration mineralogy of the Wayang Windu geothermal field, West Java, Indonesia  
Sugiarto Ganda & Djoko Hantono

Augustine volcano fumarole wall rock alteration: Mineralogy, zoning and numerical models of its formation process  
Aberra Getahun, Mark H. Reed & Robert B. Symonds

Water-rock hydrothermal experiments: Influence of rock type on solution pH and oxygen fugacity  
V.J. Grassi, G.C. Ulmer & D.E. Grandstaff

The travertine totem forest of Yellowstone National Park, USA: Geologic controls and geochemistry  
R.A. Hutchinson & J. Michael Thompson

A look at silica phases in evolving hydrothermal systems  
T.E.C. Keith

Yellowstone travertines: U-series ages and isotope ratios (C, O, Sr, U)  
Magnesium silicate scales in geothermal utilization 1431
Guðrún Sverrisdóttir, Hrefna Kristmannsdóttir & Magnús Ólafsson

Geothermometry
Correlation of the Na/K ratio in geothermal well waters with the thermodynamic properties of low albite and potash feldspar 1437
John A. Apps & Gee Minn Chang

Hydrocarbon gas ratio geothermometry in the East African Rift System 1441
W.G. Darling & J.C. Talbot

Past and present subsurface geothermal structure revealed by fluid inclusion thermometry of borehole SN-1, Sengan geothermal area, Japan 1445
B. De Vivo, F. Raia, M. Sasada & T. Sawaki

Silica geothermometers for use in predicting temperatures in Alberta Oil Sand Reservoirs during steam-assisted thermal recovery 1451
W.D. Gunter, Brian Wiwchar, Larry Holloway & E. H. Perkins

Calibration and reequilibration kinetics of cation geothermometers: An experimental study 1455
Houssein Ibrahim, Pierpaolo Zuddas, Gil Michard & Daniel Grimaud

Chemical reactions in upflow zones of geothermal systems affecting subsurface temperature estimates by chemical geothermometry 1459
G. Th. Magnúsdóttir, S. Arnórsson & Audur Andrésdóttir

Theoretical calibration of chemical geothermometers and its application to the granitic geothermal areas of SE China 1463
Pang Zhong-he

Alteration and temperature distribution within and at the margin of the volcanic zone on the Reykjaness peninsula, SW-Iceland 1467
Jens Tomasson & Hjalti Franzson

Metamorphic environments
Formation of zoned epidote in hydrothermal systems 1473
John G. Arnason & Dennis K. Bird

Dependence of hydrothermal alteration on rock texture and microporosity in mafic crystalline rocks 1477
Mark E. Brandriss, Dennis K. Bird & James R. O'Neil

A revised model for the formation of dequartzified and alkalinized granites (episyenites) 1481
C. Casquet, F. Tornos, J. M. Caballero & C. Galindo

Origin of the Maqarin, Jordan hyperalkaline groundwaters: Isotopic and geochemical evidence for in situ combustion, calcination and recarbonation of bituminous marls 1485
Ian D. Clark, Hani N. Khoury, Elias Salameh, Peter Fritz, Harald K. Seidlitz & Tony E. Milodowski
Hydrothermal alteration in two Palaeoproterozoic volcanic associations in northern Finland  
P.Eilu

Chemical variations accompanying detachment faulting in the Whipple Mountains, California, USA  
Harold Ekstrom & Jean Morrison

Evidence for the controlling effect of the high-pressure metamorphic PTt path on the mass transfer of major elements  
B.Goffé & O.Vidal

A different approach to fluid-rock-interactions applied to microtextures in metacarbonates  
S.Heuss-Aßbichler & C.Schneider

Kinetic aspects of formation of Japanese bentonite deposits  
Daizo Ishiyama, Masakazu Ito & Osamu Matsubaya

Composition and temperature effects on mass transfer during serpentinization of ultramafic rocks  
C.F.Jove

High temperature metamorphism and low temperature retrograde alteration of spontaneously combusted marls: The Maqarin cement analogue, Jordan  
Hani N.Khoury & Tony E.Milodowski

Fluid regime of glaucophane metamorphism  
G.G.Likhoidov & L.P.Plyusnina

Thermochemical determination of water activities relevant to eclogitic rocks  
H.-J.Massonne

Chemical and oxygen isotopic variations in upper-plate rocks of the Whipple Mountains detachment system, California, USA  
D.Mayo, J.Morrison & J.L.Anderson

Enhancement of porosity in gabbros by dike intrusion  
Richard J.Nevle & Dennis K.Bird

Constraining the temperature, pressure, and fluid compositional evolution of an accretionary complex by an integrated study of cement stratigraphy and tectonics  
David L.Orange, Duncan Geddes, J.Casey Moore, Randy Cox & Michael Underwood

Structural controls of fluid flow during regional metamorphism: Application of reaction front advection theory to greenschist facies metabasites in the Scottish Dalradian  
A.D.L.Skelton, C.M.Graham & M.J.Bickle

Fluid-rock interaction in skarns from La Cerdanya, Central Pyrenees, Spain: Evidence from carbon and oxygen isotopes  
A.Soler, J.Delgado, E.Cardellach & C.Ayora

Fluid interaction and deformation, the Brevard Shear Zone, Rosman, North Carolina, USA  
Jane R.Stockey & Eileen L.McLellan
Deposition from skarn-forming solution: The genesis of some vein-like skarns (with an example from the Longjiaoshan Cu-W deposit; southeastern Hubei, P.R. China)
Yanxin Wang, Zhaoli Shen & Shaozhuo Xu

Fluid flow during thrusting: A Sr isotopic study
D.M. Wayne & A.M. McCaig

Hydrothermal ore deposits
Hydrothermal replacement of carbonates by sulfides
H.L. Barnes & W.W. Gould

Reaction path models for hydrothermal Au-PGE mineralization at Coronation Hill and similar deposits of the South Alligator Mineral Field, Australia
M.S. Bloom, D.J. Gilbert, C.H. Gammons & A.R. Wilde

Computer models of formation of hydrothermal ore bodies at the expense of metals of the country rocks
H.V. Borisov & Vict. L. Barsukov

Numerical models of mineral deposition for the Acupan vein system, Philippines
David R. Cooke

Mineral paragenesis and regional zonation of granite-related Sn-As-Cu-Pb-Zn deposits: A chemical model for the Mole Granite district (Australia) based on PIXE fluid inclusion analyses
Christoph A. Heinrich & Christopher G. Ryan

Water-rock interaction in the forming process of Dongchuan copper deposit, China
Renmin Hua, Huichu Ruan, Pei Ni & Dennis P. Cox

Subsurface hydrothermal genesis of ores and minerals in recent hydrothermal system of Uzon caldera in Kamchatka, Russia
Gennady A. Karpov

Relations between terrestrial heat flow and uranium deposits in Jiangxi Province, China
Li Xueyi, Zhou Wenbin, Zhang Weimin & Sun Zhanxue

Stable isotopic geochemistry of ore-forming solutions and genesis of a gold deposit in Maopai, Jiangxi Province, China
Liu Xiaodong, Xu Haijiang & Lai Shaocong

Au sorption by arsenic compounds and organic matter
I.Ya. Nekrasov

Hydrothermal systems related to epithermal gold deposits in Mesozoic volcanic areas in eastern China
Qijang Ren, Chongze Zhang, Rongyong Yang, Xiaojun Xie & Zhaowen Xu

Metal transport and deposition in hydrothermal systems buffered by mineral assemblages
Gilpin R. Robinson, Jr
Fluid-rock interaction at the Kaneuchi tungsten deposit in Japan
Yasuhiro Shibue, Masami Noto & Kohei Kazahaya

Isotope geochemistry of oxygen and hydrogen for ore-forming hydrothermal solution in
Xiangshan uranium orefield, China
Sun Zhanxue, Li Xueli & Shi Weijun

Fluid-rock interaction and cassiterite deposition
T.M. Sushchevskaya & M.V. Borisov

Si, Al, and W behavior in HF aqueous solutions in relation to the greisen problem
George P. Zaraisky

Evidence of ancient hydrothermal activity and the relation to gold mineralization in the Rehai
geothermal system, Yunnan, China
Zhu Meixiang

Seawater-rock interactions

Oceanic metamorphism in the Kuyul ophiolitic terrane of north Kamchatka, Russia
O.V. Chudaev & V.B. Kurnosov

Spilitic alteration as the source of the world-class Proterozoic manganese deposit
D.H. Cornell & S.S. Schütte

Alkali basalt/seawater hydrothermal alteration
I.V. Kholodkevich, J.L. Bischoff & R.J. Rosenbauer

Hydrothermal water-basalts interaction in the ocean
Victor B. Kurnosov

Oceanic borehole fluid chemistry from Site 504B: Seawater/rock reaction within the
borehole environment
Andrew J. Magenheim, Greg Bayhurst, Joris M. Gieskes & Jeff Alt

Formation of authigenic smectite and zeolite and associated major element behavior during
early diagenesis of volcanic ash in the Nankai Trough, Japan, ODP leg 131

Geochemistry of subduction-induced cold seepage at the eastern Nankai Trough, Japan
H. Sakai, T. Gamo, Y. Ogawa & J. Boulegue

Peridotite-seawater interaction at Zabargad Island, Red Sea
P.F. Sciuto

The isotopic composition of helium and sulphur in hydrothermal fluids trapped in ancient and
modern sea floor deposits
F. Stuart, G. Turner & J. Maynard

Microbial green marine clays in the hydrothermally altered deep sea sediments
Kazue Tazaki, Kōichi Tazaki & W.S. Fyfe
Short-term variability, phase separation and water-rock reaction in hydrothermal fluids from 9-10°N, East Pacific Rise

K.L. Von Damm

Author index