

SUBJECT INDEX

Papers are listed under subject headings based on symposia organised for the Goldschmidt Conference in Edinburgh in August-September, 1994. Sub-headings are used for the larger symposia, and often these sub-headings cover material which overlaps several symposia. The subject headings and their research areas are briefly outlined below, and these are followed by listings of the papers in alphabetical order under each subject heading or sub-heading.

1. **Theoretical geochemistry** - applications of theoretical mineral physics to mineral chemistry and element distribution, including aspects of diffusion; ab initio methods.
2. **Experimental geochemistry** - laboratory experimental studies across the full spectrum of P-T conditions.
3. **Geochemical techniques** - developments in instrumentation and techniques; special applications and programmes.
4. **Weathering and erosion, deposition and diagenesis** - geochemical processes in low temperature rock degradation and genesis.
5. **Groundwater chemistry and palaeohydrology** - geochemical characterisation of ground-water systems and of time dependent hydrogeological changes, significance to palaeo-environments, prognoses of future changes.
6. **Waste containment and pollutant transport** - geochemical assessment of the controls and risks of all types of waste and pollutant disposal.
7. **Ocean composition and fluxes during the Quaternary** - high resolution documentation of changes in marine geochemistry, and geochemical indicators of recent events.
8. **Ocean palaeochemistry and the evolution of the ocean basins** - the geochemistry of ocean evolution in the pre-Quaternary.
9. **Modern submarine hydrothermal processes** - controls on the geochemical reactions within sub-seafloor hydrothermal systems, and their spatial and temporal variability.
10. **Mechanisms of isotopic and chemical communication in crust and mantle rocks** - application of new microanalytical (ion and laser probe) techniques to constrain micron to millimetre scale processes in rocks, and their relevance to macroscopic studies of mass and heat transport.
11. **Partitioning of elements** - new data on partition coefficients for mineral, melt, fluid phases as determined by experiment or measurement of natural phases; including aspects of the distribution of precious metals.
12. **Dehydration, partial melting and fluid distribution in the crust** - covering both the geochemistry of high-temperature processes in the continental crust and the modification of crust undergoing subduction.
13. **Magma generation processes** - geochemical evidence of the generation and evolution of mantle-derived melts.
14. **Mantle development in space and time** - geochemical and mineralogical information on mantle constitution.
15. **Geochronometry and thermal history** - quantitative thermal histories of rocks and metamorphic belts.

1. Theoretical geochemistry

D'Arco, P, Sandrone, G,
Dovesi, R, Saunders, V R
Edwards, A, Freer, R, Catlow,
C R A

Made, B J A D

Matsui, M

Parker, S C

Silvi, B, Savin, A

Tossell, J A

Vocadlo, L, Wall, A, Parker, S
C, Price, G D

Wentzcovitch, R M, Ross, N L,
Price, G D

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R A

Xiao, Y, Lasaga, A C

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Ab initio study of the relative stability under pressure of
MgSiO₃-ilmenite, -perovskite, and (periclase + stishovite)

Combined experimental and computer simulation studies of
cation diffusion in silicate garnets

Empirical relations to estimate kinetic constants of silicates

A transferable interatomic potential model for crystals and melts
in the system CaO-MgO-Al₂O₃-SiO₂

Atomistic simulation studies of mineral surfaces and the role of
impurities on their structure and stability

Chemical bonds in minerals: Topological analysis of the electron
localization function

Theoretical studies of the speciation of Sb in sulphidic solutions

Absolute ionic diffusion in MgO: computer calculations via
lattice dynamics

Ab initio constant pressure molecular dynamics study of silicate
perovskites

Oxygen diffusion and water-related defects in feldspar minerals:
information from experimental and modelling studies

Applications of ab initio quantum mechanical potential surfaces
to mineral physics calculations

Oxygen isotope fractionation in metal monoxides

2. Experimental geochemistry

2a. *Experimental constraints on melting in the mantle*

See listing under section 13a

2b. *Acidic and other melts and fluids at high P and T*

Baker, D R, Vaillancourt, J

Ballhaus, C

Blencoe, J G

Davies, A, Wood, B J, Barry, T,
Dinsdale, A, Gisby, J

Frost, D J, Wood, B J

Gessmann, C, Spiering, B,
Raith, M

Henderson, G S, Fleet, M E

Hudon, P, Baker, D R, Pelton,
A D, Wu, P

Hurwitz, S, Lyakhovsky, V,
Navon, O

Kadik, A A, Shilobreva, S,
Vernadsky, V

Kohn, S C, Brooker, R A

Konzett, J, Ulmer, P, Sweeney,
R J, Thompson, A B

Luth, R W

Manning, C E

The viscosity of F + H₂O-bearing peralkaline and peraluminous
rhyolitic melts

C-H-O fluid speciations under mantle conditions

Calculated activities for species in albite-water melts

The thermodynamics of mineral-melt equilibria in the system
CaO-MgO-Al₂O₃-SiO₂

Carbon dioxide fugacities at high temperature and pressure

Experimental investigation of the Fe-Mg-partitioning between
garnet and biotite with respect to the influence of Ti in biotite

The structure of Ti-silicate glasses by Raman spectroscopy:
Implications for the role of Ti in natural melts

Disappearance of the liquid-liquid miscibility gap in the system
CaO-MgO-SiO₂ at high pressure

Diffusive growth of water bubbles in rhyolitic melts

The primary carbon and the formation of carbon species in
terrestrial magmas

The effect of water on the solubility and speciation of CO₂ in
aluminosilicate glasses along the join SiO₂-NaAlO₂

Phase relations and chemistry of richteritic amphiboles in the
system K₂O-Na₂O-CaO-MgO-Al₂O₃-SiO₂-H₂O
(KNCMASH)

Carbonation reactions in eclogites at high pressure: implications
for carbonic fluids in the mantle

Experimental determination of the solubilities of quartz, kyanite
and corundum in H₂O in the lower crust and mantle

- Marr, R A, Baker, D R,
Williams-Jones, A E
Mungall, J E, Dingwell, D B
Popp, R K, Virgo, D, Yoder, H
S, Hoering, T C, Phillips, M W
Shen, A H, Chou, I,
Bassett, W A
Snyder, D, Gier, E,
Carmichael, I
Thompson, P
Wood, B J, Brodholt, J P
- Alkali zirconosilicate speciation in halogen-rich, felsic, peralkaline magmas
Effects of water content, temperature and pressure on actinide tracer diffusion in melts of haplogranitic composition
The role of hydrogen fugacity in controlling Ferric-Ferrous ratio and volatile content of Kaersutitic amphibole : an experimental study
Experimental determination of PVTX relations of fluids in the diamond-anvil cell
Experimental measurements of the thermal conductivity of molten silicates
The sanidine - 'sanidine hydrate' reaction boundary
The density of water to 25kbar/1873K

2c. Mantle mineralogy and the transition zone

- Gasparik, T
Harte, B, Harris, J W
Harte, B, Hutchison, M T,
Harris, J W
Irifune, T
Kesson, S E, FitzGerald, J,
Shelley, J M
Pawley, A R, Wood, B J
Ulmer, P, Trommsdorff, V,
Reusser, E
Wood, B J, Helffrich, G
- Experimentally determined melting relations in simple and complex chemical systems at pressures up to 23 GPa
A review of natural mineral assemblages from the mantle transition zone
Trace element characteristics of the lower mantle - An ion probe study of inclusions in diamonds from Sao Luie
Phase transformations in pyrolite and subducted crust compositions down to a depth of 800 km in the lower mantle.
Phase relations for the former basaltic crust of the slab in the perovskite facies of the lower mantle
Talc dehydration to 50 kbar: constraints on the volume of H₂O at high pressure
Experimental investigation of antigorite stability to 80 kbar
Mantle stratification: constraints from mineral physics, seismological and phase equilibrium data

2d. Mineral dissolution, interfaces and hydrothermal solutions

- Azaroual, M, Pauwels, H,
Meunier, A, Sardini, P
Bateman, K, Noy, D J, Pearce,
J M, Savage, D
Bebie, J, Hovey, J, Seward, T M
Benezeth, P, Diakonov, I,
Pokrovski, G, Dandurand, J
J, Schott, J
Benning, L G, Seward, T M
Casey, W H, Rock, P A,
McBeath, M M, Walling, E
M, Chung, J-B
Devidal, J-L, Dandurand, J-L,
Gout, R
Diakonov, I, Pokrovski, G,
Castet, S, Schott, J, Gout, R
Finley, J B, Nordstrom, D K
Fouillac, C, Azaroual, M
Gammons, C H, Williams-Jones,
A E, Yu, Y
- Fluid flow equipment for hydrothermal investigations: apparatus and preliminary results
Coupled flow and reaction: a modelling and experimental study of zeolite diagenesis
Thallium (I) chloride complexing in aqueous media to 200°C
Gallium solubility and aqueous speciation in hydrothermal solutions (60–125°C). Experimental study and comparison with aluminium
Hydrosulphide complexes of gold (I) at high pressures and temperatures: equilibrium and kinetic problems
A new method for determining excess Gibbs energies in binary metal-carbonate solid solutions
Solubility of kaolinite in alkaline solutions at hydrothermal conditions
Experimental study of Na-Al complexing in hydrothermal solutions
Evaluation of the chemical model in WATEQ4F: 1. The major ion activity coefficients - Na, K, Ca, Mg, Cl
Comparison between actual and theoretical dissolution rates in a granite-water interaction experiment at 180°C and 14 bar
New data on the stability of gold(I) chloride complexes at 300°C

- Gammons, C H, Wood, S A,
Williams-Jones, A E
Gehring, A U, Schosseler, P M,
Luster, J
Hellmann, R
- Merino, E, Wang, Yutian,
Wang, Yifeng, Nahon, D
Mountain, B W, Seward, T M
- Oelkers, E H, Schott, J
- Pokrovski, G, Schott, J,
Sergeyev, A
- Pokrovskii, V A, Helgeson, H C
- Rochelle, C A, Bateman, K,
MacGregor, R, Pearce, J M,
Savage, D, Wetton, P
Seward, T M, Henderson, C M
B, Charnock, J M, Dobson,
B R
- Small, J S, Manning, D A C
- Small, J S, Manning, D A C
- Valsami-Jones, E, Bailey, E H,
Ragnarsdottir, K V
Wogelius, R A, Refson, K,
Fraser, D G, Goff, J P,
Grime, G W
- Experimental investigation of the stability of neodymium chloride complexes at 300°C
The chemical form of Mn(II) and V(IV) in mineral phases as determined by EPR spectroscopy
A leached layer hydrolysis model: A better way to understanding feldspar dissolution at elevated temperatures and pressures
Implications of pseudomorphic replacement for reaction-transport modelling in rocks
The solubility of sparingly-soluble minerals at 25°C using a flow-through column
Experimental study of kyanite dissolution rates as a function of Al and Si concentration
Determination of the sodium-borate association constant $\text{NaB}(\text{OH})_4$ between 75 and 200°C using new sodium selective glass electrodes
Calculation of the effect of $\text{KAl}(\text{OH})\text{O}_4$ formation on the solubility of corundum at high pressures and temperatures
Migration of cement pore fluids from a radioactive waste repository: Experimental studies of chlorite dissolution rates
A synchrotron EXAFS study of hydrothermal AgNO_3 solutions
Competition between metal-carboxylate complexing, mineral precipitation, and carboxylate decomposition reactions
On-line monitoring of clay mineral precipitation in sandstone porespace under flow conditions
Experimental investigation of the solubility of uranium (VI) under hydrothermal conditions
Hydration reactions at the mineral-fluid interface: Experimental and computational studies

2e. *Stable isotope partitioning.*

- Bezmen, N I
- Cole, D R
- Driesner, T, Seward, T M
- Rosenbaum, J M, Matthey, D P,
Elphick, S
Tennie, A, Hoffbauer, R,
Hoernes, S
Zheng, Y-F, Metz, P, Satir, M
- The above liquidus inhomogeneity and cluster differentiation of fluid magmatic melts
Oxygen isotope exchange rates in mineral-fluid systems: correlations and predictions
Effects of dissolved salts on calcite-water oxygen stable isotope fractionation at elevated temperatures and pressures
Equilibrium garnet-calcite oxygen isotope fractionation
Experimental determination of the oxygen isotope fractionations in the systems kyanite-calcite and talc-carbonate-water
Experimental calibration of oxygen isotope fractionation between calcite and tremolite in the presence of $\text{CO}_2\text{-H}_2\text{O}$ fluid and a new data processing method for three phase systems

3. *Geochemical techniques, instrumentation and special applications.*

- Galer, S J G, Laue, H-J,
Goldstein, S L, Mezger, K,
Hofmann, A W
Hallbauer, D K
- Concept of a new thermal isotope mass spectrometer
Geochemical trace element analysis for ionic species by capillary electrophoresis

- Halliday, A N, Lee, D-C,
Christensen, J N, Yi, W,
Hall, C M, Jones, C E,
Teagle, D, Walder, A J,
Freedman, P A
Holdham, M T, Jarvis, I
Lahtinen, R, Lestinen, P,
Korkiakoski, E, Salminen, R,
Sandstrom, H, Savolainen, H,
Vallius, H
Petit, J-C
Sackett, W
van Moort, J C
- I.C.P. magnetic sector multicollector mass spectrometry and its applications to geochemistry
A new method for the determination of the platinum group elements in sedimentary materials
Rock geochemistry research project (RGRP) in the Geological Survey of Finland
Applying MeV ion beam techniques to geochemical issues: Cross-fertilizing nuclear physics and geosciences
The utility of sediment pyrolysis
The chemical composition and paramagnetism of auriferous quartz

4. Weathering and erosion, deposition and diagenesis

4a. Early diagenesis

- Albrecht, A, Beer, J
Bailey, A M, Roberts, H H,
Blackson, J H
Burdige, D J, Dhakar, S P
Coleman, M
Cundy, A B, Croudace, I W
Davison, W, Zhang, H, Miller, S
Donahoe, R J, Liu, C, Dobson, K, Graham
Furukawa, Y, Barnes, H L
Gonzalez-Lopez, J M,
Fernandez-Nieto, C, Lopez-Galindo, A, Torres-Ruiz, J
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Ingri, J, Torssander, P,
Andersson, P S, Morth, C-M
Krom, M, Davison, P, Zhang, H, Davison, W
Krupp, R E, Suleimenov, O M
Luck, J-M, Ben Othman, D
Markel, D, Kolodny, Y, Luz, B,
Nishri, A
Michel, C
Muller-Sigmund, H D
- The use of ^{137}Cs and ^{210}Pb to model erosive processes in high altitude settings; The Muttsee (Switzerland) example
Diagenetic mineral formation in sediments of the Mississippi River delta plain
Mathematical models of diagenetic processes in marine sediments: iron and manganese redox cycling and non-steady state diagenesis
Why diagenetic carbonate concretions form: localised microbial buffering
Geochemical studies of salt marsh sediments: Evidence for possible ^{210}Pb mobility
Developing and applying new techniques for measuring steep chemical gradients of trace metals and inorganic ions at the sediment-water interface
Cycling of iron and manganese in a Riparian wetland
Replacement mechanisms among iron sulphide minerals
Carbonates associated with the Almazan sepiolite-palygorskite deposits (northern Spain)
A new method for the determination of the platinum group elements in sedimentary materials
Hydrogeochemistry of sulphur isotopes in the Kalix River catchment, northern Sweden
High resolution sampling of pore waters using a gel probe from Eshwaite Water, Lake District
Thermodynamics of aqueous H_2S solutions at elevated temperatures: solubility and first dissociation constant
Trace Pb, Zn, Cd, Tl contents and Pb-Sr radiogenic isotopes in the dissolved and particulate phases of a river during high-water stage: constraints on the origin(s) and transport of the metals
Tracing phosphorus sources and P-cycling by oxygen isotopes in phosphate; Laker Kinneret (Israel)
A regular pattern of chert within Lower Carboniferous limestones at the Benbulbin Range, NW-Ireland
Tracing sedimentary textures and source materials in paragneisses from the Bohemian Massif (Germany)

- Novak, M, Wieder, R K
 Pierre, C, Taberner, C,
 Urquiola, M M, Pueyo, J J
 Postma, D
 Rickard, D
 Sackett, W
 Schaller, T, Wehrli, B
 Sholkovitz, E
 Wehrli, B, Dinkel, C, Muller, B
- Sulphur diagenesis in freshwater peatlands
 Sulphur and oxygen isotopic composition of sulphates in hypersaline environments, as markers of redox depositional versus diagenetic changes
 Kinetics of Fe(III) reduction in a marine sediment
 A new sedimentary pyrite formation model
 The utility of sediment pyrolysis
 Focusing patterns of transition metals in lake sediments - indicators for the reconstruction of deep-water mixing in the past?
 Fractionation of Rare Earth Elements in rivers and estuaries
 Measurements of benthic gradients in deep lakes with ion-selective electrodes and video endoscopy

4b. *Weathering of geological systems*

- Bricker, O P
 Cochran, M F, Berner, R A
 Faure, G, Nishiizume, K
 Gislason, S R, Arnorsson, S, Arnannsson, H
 Holland, H D, Kuo, P H, Rye, R O
 Phillips, F M, Bowen, D Q, Elmore, D
 Schwartzman, D
 Tranter, M, Brown, G, Sharp, M,
 White, A F, Blum, A E
- Weathering and mass-balance budgets in small catchments
 Vegetative enhancement of chemical weathering
 Exposure dating of quartz sandstone in the Transantarctic Mountains by cosmogenic ^{10}Be and ^{26}Al
 Present chemical weathering of basalt in Iceland
 O_2 and CO_2 in the Late Archaean and Early Proterozoic atmosphere
 Surface exposure dating of glacial features in Great Britain
 Biotic enhancement of weathering redux
 Chemical weathering beneath Alpine glaciers: rates and implications for CO_2 drawdown
 Effects of climate on chemical weathering in watersheds underlain by granitoid rocks

4c. *Weathering of minerals*

- Akagi, T, Nakai, S, Masuda, A
 Brantley, S L, Stillings, L
 Cama, J, Ganor, J, Lasaga, A C
 Dobrovolsky, E V
 Drever, J I, Murphy, K M, Clow, D W
 Ganor, J, Lasaga, A C
 Levy, D B, Amrhein, C
 Made, B J A D, Ben Baccar, M, Fritz, B
 Maurice-Johnsson, P A
 May, F
 Mogollon, J L, Perez, D, Lo Monaco, S, Ganor, J, Lasaga, A C
 Mountain, B W, Williams-Jones, A E
 Ngwenya, B T, Shimmiel, G B, Elphick, S C
 Plettinck, S, Chou, L, Wollast, R
- The tetrad effect, a general effect in partitioning of REE between aqua and solid
 An integrated model for feldspar dissolution under acid conditions
 The kinetics of smectite dissolution
 Replacement reactions during weathering: macrokinetic approach
 Field weathering rates versus laboratory dissolution rates: An update
 The effects of oxalic acid on kaolinite dissolution rate
 The coprecipitation of Mg and Si with calcium carbonate
 Geochemical modeling of diagenetic reactions
 Use of AFM in experimental surface geochemistry
 Weathering or hydrothermal alteration? - Examples from the Rhenish Massif, Germany
 The effect of pH, HClO_4 , HNO_3 and ΔG on the dissolution rate of natural gibbsite using column experiments
 Experimental simulations of fluid-rock interaction: The effect of surface area on the rate of alteration
 An experimental study of fluid-rock interaction: application to groundwater aquifers
 Kinetics and mechanisms of dissolution of silica at room temperature and pressure

- Pokrovsky, O S
Schweda, P, Kalinowski, B
- Vali, H, Sears, S K, Hesse, R,
Martin, R F
- 4d. Diagenesis of rocks*
- Bock, B, McLennan, S M,
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- Bustillo, M, Bustillo, M A
- Caritat de, P, Bloch, J,
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Abercrombie, H J
- Gorokhov, I M, Turchenko, T
L, Melnikov, N N
- Hallbauer, D K, Barton, E S
- Hayashi, K-I, Fujisawa, H,
Ohmoto, H, Holland, H D
- Klammer, D
- Lopez-Galindo, A, Oloriz, F,
Rodriguez-Tovar, F J
- Martinez-Ruiz, F, Ortega-
Huertas, M, Palomo, I
- McGill, R A R, Fallick, A E,
Hall, A J
- Merino, E, Wang, Y, Deloule, E
- Miller, S, Macdonald, D I M
- Murphy, A, Jarvis, I
- Ortega-Huertas, M, Martinez-
Ruiz, F, Oddone, M, Palomo, I
- Pablo-Galan, de, L, Chavez-
Garcia M L, Dimas, G
- Palomo, I, Ortega-Huertas, M,
Martinez-Ruiz, F, Nocchi, M,
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- Paquette, J, Vali, H, Mountjoy,
E W
- Prudencio, M I, Gouveia, M A,
Sequeira Braga, M A,
Figueiredo, M O
- Shikazono, N
- Spears, D A
- Kinetics of CaCO_3 homogeneous precipitation in seawater
Dissolution rates and alteration of muscovite, phlogopite and
biotite at pH 1 to 4, room temperature
An alternative approach to assess the true nature of 2:1 mixed-
layer silicates in diagenetic and weathering environments
- Does redistribution of rare earth elements in turbidites of the
Appalachian foreland basin compromise provenance
information?
- REE study in Jurassic radiolarites from the subbetic, Betic
Cordillera, Spain
- A comparison of shale compositions from the Western Canada
sedimentary basin and the US Gulf coast: the importance of
depositional composition on shale diagenesis
- Multi-stage illite evolution in Upper Proterozoic shales: Rb-Sr,
XRD and TEM studies
- Crustal evolution in the source region of the Witwatersrand
sediments, South Africa - evidence from quartz
- Geochemistry of Proterozoic (~1.9 Ga) sedimentary rocks from
the Labrador district, Canada
- Rock porosity and element distribution in an extremely acid
sulphate altered Tertiary Latite, Styria, Austria: a
comparison
- Geochemical traces and sequence stratigraphy analysis during
the Upper Jurassic in South Iberia
- The Cretaceous-Tertiary boundary in the Betic Cordilleras and
Basque Cantabrian Basin; a study of the platinum group
elements anomalies
- Stable isotopic constraints on palaeoenvironment, temperatures
and fluids, from silica and carbonate phases; East Kirkton,
West Lothian, Scotland
- Genesis of banded, fibrous and twisted quartz by 'catalysis',
unstable crystallization fronts, and substitution: self-
organisation in agates
- Diagenetic and thermal history of a fore-arc basin sequence -
The Himalia Ridge Formation, Alexander Island, Antarctica
- Fluid-rock interactions in chalk groundwater systems: an initial
investigation into geochemical composition of Upper
Cretaceous chalks from SE England
- REE behaviour across the Cretaceous-Tertiary boundary
- Diagenesis of Miocene vitric tuffs to zeolites, Mexican
Highlands, Mexico
- Geochemical characteristics of Toarcian sedimentation in Alpine
geological domains
- Growth and dissolution characteristics of dolomite studied in
ultrathin section: a new TEM approach
- REE distribution as an indicator of the origin of carbonates and
silicates in basaltic rocks
- Stable isotopes, minor elements and diagenetic alteration
associated with Tono sandstone-type uranium deposits in
Japan
- Geochemistry and mineralogy of some British coals

Vinogradov, V I

Isotopic indicators of epigenetic alteration of Upper Proterozoic sediments on Siberian platform

4e. Experimental studies of mineral dissolution, interfaces and hydrothermal solutions

See section 2d

5. Groundwater chemistry and palaeohydrology

Appelo, C A G

A chromatographic model for water quality variations in the Aquia aquifer (Maryland, USA)

Aquilina, L, Boulegue, J F,
Sureau, J F

Hydrogeochemical investigation of the passive margin of the south east basin of France. GPF Programme

Cardenal, J, Walraevens, K

Chromatographic pattern in a freshening aquifer (Tertiary Ledo-Paniselian aquifer, Flanders-Belgium)

Caritat de, P

Time-dependent variations in groundwater chemistry: the Norwegian groundwater monitoring network

Cave, M, Reeder, S, Metcalfe, R

Chemical characterisation of core pore-waters for deep borehole investigations at Sellafield, Cumbria

Dearlove, J P L

Baseline hydrogeochemical study of shallow groundwaters in N E England

Fritz, S J, Harvey, F E,
Drimmie, R J, Johnston, C,
Frape, S K

Tritium variability of repeated samplings of well waters in south Ontario

Gascoyne, M

Isotopic and geochemical evidence for old groundwaters in a granite on the Canadian shield

Lesniak, P M

¹³C in low temperature, CO₂-charged waters: a need for consistency with carbonate chemistry

Livnat, A, Spiro, B, Kronfeld, J

Isotopic evidence for age of intense spring activity in the Arava Valley, Israel, during Quaternary times

Maiwald, U, Pekdeger, A

The influence of open-cast lignite mining on adjacent ground water systems

Metcalfe, R, Darling, W G,
Crawford, M B, Hooker, P J,
Bath, A H

The origins of deep groundwaters in Cumbria, northwest England: hydrochemical constraints

Michard, G, Pearson, F J Jr.

Chemical evolution of waters in long term interaction with granitic rocks: example of waters from Nagra boreholes, North Switzerland

Okrugin, V M, Kokarev, S G,
Okrugina, A M, Chubarov, V
N, Shuvalov, R A

An unusual example of the interaction of modern hydrothermal system with Au-Ag veins (South Kamchatka)

Okrugin, V M, Stepanov, I I,
Shuvalov, R A
Pauwels, H

Mercury as pathfinder in geochemical exploration of hydrothermal gold-silver deposits in Kamchatka

Peterman, Z E, Stuckless, J S

Natural denitrification in groundwater in the presence of pyrite: Preliminary results obtained at Naizin (Brittany, France)
Strontium isotope characterization of flow systems in southern Nevada, USA

Petit, J-C

Applying MeV ion beam techniques to geochemical issues: Cross-fertilizing nuclear physics and geosciences

Pitkanen, P, Snellman, M V

Modelling of hydrochemical evolution in coastal regression area in Finland: a mass balance approach

Quattrocchi, F, Calcara, M

Groundwater chemistry in some Italian seismic areas: space and time correlations with tectonic features and seismic activity

Ruotsalainen, P H, Snellman, M V

The hydrogeochemical characterization of deep groundwaters in crystalline bedrock: investigations in boreholes with multipackers

- Sanjuan, B, Mossmann, J R,
Merceron, T
Stepanov, I I
- Varsanyi, I, Kovaks, L O,
- Wallin, B G K, Peterman, Z E
- Walraevens, K, Cardenal, J
- Modelling boom clay formation porewater chemistry: Ion exchange versus dissolution precipitation mechanisms
- Distribution of mercury concentrations in the atmosphere over the Western part of the Pacific Ocean
- The origin of nitrogen in aquifer systems in the great plain, Hungary
- Stable and radiogenic isotope systematics in ground water and fracture fillings at Aspo, Sweden
- Aquifer recharge and exchangeable cations in a Tertiary clay layer (Bartonian clay, Flanders-Belgium)

6. Waste containment and pollutant transport

- Albrecht, A, Beer, J, Gloor, M,
Fischer, A, Mattle, N
Atkins, M, Glasser, F P
- Ben Othman, D, Luck, J-M
- Berry, J A, Bishop, H E, Cowper, M M, Fozard, P R, McMillan, J W, Mountfort, S A
- Birke, M, Rauch, U
Chudaeva, V A
- Cidu, R, Caboi, R, Fanfani, L, Frau, F
- Cooper, G I, Cox, G A, Perutz, R N
- Falck, W E, Biehler, D
- Gouveia, M A, Freitas, M C, Prudencio, M I
- Gutierrez-Mas, J M, Lopez-Galindo, A
- Jostons, A, Kesson, S E
- Le Forestier, L, Libourel, G, Brown, W L, Mosnier, F, Renaud, P
- Lee, S, Spears, D A
- Lottermoser, B G
- Made, B J A D, Jamet, P, Salignac, A
- Okrugin, V M, Stefanov, J M, Shuvalov, R A, Okrugina, A M, Stepanov, I I
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10. Mechanisms of isotopic and chemical communication in crust and mantle rocks

10a. *Small-scale evidence of geochemical processes in mantle rocks and ultrabasic complexes*

See section 14g

10b. *Spatial distribution of isotope and trace element variations in rocks and magmas, and their implications*

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11. Partitioning of elements

11a. Partition coefficients for silicate melts, minerals and associated fluids

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13. Magma generation processes

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13d. Mafic-ultramafic rocks and complexes

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14a. Experimental constraints on melting in the mantle

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14b. Source regions, extraction and evolution of basaltic melts

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14c. Mantle mineralogy and the transition zone.

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