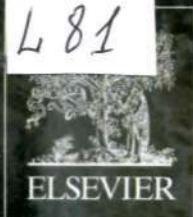


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# LITHOS

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# Lithos

Volumes 162–163, Pages 1-332 (March 2013)

## Editorial Board

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Research Papers

## Paragonite in marbles from the Tauern Window, Austria: Compositional and thermobaric controls

Original Research Article

*Pages 1-13*

G.T.R. Droop

### Highlights

► Investigation into the petrogenetic significance of paragonite in carbonate rocks. ► Wide  $P$ – $T$ – $X(\text{CO}_2)$  stability fields for  $\text{Pa} + \text{CaCO}_3 + \text{Qtz}$  and  $\text{Pa} + \text{Dol} + \text{Qtz}$  ► High bulk  $\text{Na}/(\text{Na} + \text{K})$  and  $\text{Al}/(\text{Na} + \text{K})$  facilitates paragonite stability in marbles ► Peak metamorphism in Döllach marbles:  $T = 510 \pm 20$  °C,  $P > 0.77$  GPa,  $X(\text{CO}_2) < 0.065$  ► Fluorine partitioning in hydrous phases:  $X_{\text{F}}: \text{Tr} > \text{Phe} > \text{Pa} \approx \text{Chl}$

## Pressure–temperature structure of a mylonitized metamorphic pile, and the role of advection of the lower crust, Nagasaki Metamorphic Complex, Kyushu, Japan

Original Research Article

*Pages 14-26*

K. Miyazaki, T. Ikeda, K. Arima, M. Fukuyama, K. Maki, T.-F. Yui, M. Grove

### Highlights

► We describe  $P$ – $T$  structure of mylonitized metamorphic pile. ► The mylonitized pile shows abnormal high thermal gradient. ► The mylonitized pile was formed at depths of lower crust. ► Numerical models suggest that the pile was formed underneath volcanic arc to forearc. ► We conclude that the horizontal advection is crucial to formation of the pile.

## Devonian/Mississippian I-type granitoids in the Western Carpathians: A

## **subduction-related hybrid magmatism**

Original Research Article

*Pages 27-36*

Igor Broska, Igor Petřík, Yaron Be'eri-Shlevin, Jaroslaw Majka, Vladimír Bezák

### **Highlights**

► Late Devonian–Early Carboniferous I-type granitoids in the Western Carpathians ► Magmatism of volcanic arc type related to subduction of Paleotethys ► Proto-Tatricum terrane in the Late Devonian–Early Carboniferous is suggested.

## **The geochemical and Sr —Nd isotopic characteristics of Paleozoic fractionated S-types granites of north Queensland: Implications for S-type granite petrogenesis**

Original Research Article

*Pages 37-56*

David C. Champion, Robert J. Bultitude

### **Highlights**

► S-types granites dominate the eastern Hodgkinson Province, north Queensland, Australia. ► These granites form two major geochemical groups and 5 minor groups. ► The observed geochemical variation is a result of extensive crystal fractionation. ► Restite unmixing and/or magma mixing must have preceded crystal fractionation. ► Multiple components or a more juvenile sedimentary protolith are also required.

## **Geochemical components in a Cretaceous island arc: The Th/La–(Ce/Ce\*)<sub>Nd</sub> diagram and implications for subduction initiation in the inter-American region**

Original Research Article

*Pages 57-69*

Alan R. Hastie, Simon F. Mitchell, Peter J. Treloar, Andrew C. Kerr, Iain Neill, Dan N. Barfod

### **Highlights**

► A mantle plume component is found in Cretaceous Caribbean arc rocks. ► The Th/La–(Ce/Ce\*)<sub>Nd</sub> diagram distinguishes sedimentary components in a slab flux. ► Caribbean subduction polarity reversal occurred in the Turonian–Campanian.

### **Zircon U–Pb age constraints from Iran on the magmatic evolution related to Neotethyan subduction and Zagros orogeny**

Original Research Article

*Pages 70–87*

Han-Yi Chiu, Sun-Lin Chung, Mohammad Hossein Zarrinkoub, Seyyed Saeid Mohammadi, Mohammad Mahdi Khatib, Yoshiyuki Iizuka

#### **Highlights**

► Reporting new zircon U–Pb and Ar–Ar ages of two major magmatic belts across Iran ► Arc magmatism migrated inland and renewed in the UDMA during the Late Cretaceous ► Magmatic flare-ups in the UDMA lasted from the Eocene and Oligocene (55–25 Ma). ► The UDMA magmatism terminated progressively from northwest to southeast.

### **Sr and Nd isotopic compositions of mafic xenoliths and volcanic rocks from the Oga Peninsula, Northeast Japan Arc: Genetic relationship between lower crust and arc magmas**

Original Research Article

*Pages 88–106*

Masatsugu Yamamoto, Hiroo Kagami, Akiyuki Narita, Takahiko Maruyama, Azusa Kondo, Shiho Abe, Rika Takeda

#### **Highlights**

► The lower crust influences isotopic variations in arc magma. ► Ichinomegata mafic xenoliths comprise variably metasomatized lower-crustal material. ► Metasomatism produced variations in Sr–Nd isotopes and trace element concentrations. ► Isotopic variations in volcanic rocks overlap with the isotopic trend of xenoliths. ► Metasomatic processes resulted in contamination of the volcanic rocks.

### **<sup>40</sup>Ar/<sup>39</sup>Ar geochronology constraints on the formation age of Myanmar jadeitite**

Original Research Article

*Pages 107–114*

Min Qi, Hua Xiang, Zeng-Qiu Zhong, Hua-Ning Qiu, Hao Wang, Xi-Lin Sun, Bin Xu

## Highlights

► First direct dating of the Myanmar jadeite yielded a  $^{40}\text{Ar}/^{39}\text{Ar}$  age of  $123.9 \pm 3.4$  Ma. ► A late HP metasomatic event is dated at the 93 Ma. ► The Myanmar jadeitites were formed by the multistage of metasomatism.

## **Deciphering lava flow post-eruption differentiation processes by means of geochemical and isotopic variations: A case study from Mt. Etna volcano**

Original Research Article

*Pages 115-127*

Silvio Mollo, Piergiorgio Scarlato, Gabriele Lanzafame, Carmelo Ferlito

## Highlights

► From the basal zone to the uppermost crust of a lava flow, groundmass microlites show more primitive compositions. ► Crystals record higher crystallization temperatures with increasing vertical height. ► The redox state of the melt also increases. ► Due to strong volatile degassing, trace elements and oxygen isotopes change in the lava flow.

## **Generation and evolution of siliceous high magnesium basaltic magmas in the formation of the Permian Huangshandong intrusion (Xinjiang, NW China)**

Original Research Article

*Pages 128-139*

Jian-Feng Gao, Mei-Fu Zhou

## Highlights

► The intrusion was formed from two magma pulses of siliceous high-Mg basaltic magmas. ► Parental magmas were derived from a hydrous and depleted mantle. ► Two pulses underwent various differentiation and S-saturation. ► SHMB magmatism may be a common feature in orogenic belts.

## **Petrogenesis of the Cretaceous Zhangzhou batholith in southeastern China: Zircon U–Pb age and Sr–Nd–Hf–O isotopic evidence**

Original Research Article

*Pages 140-156*

Jing-Yuan Chen, Jin-Hui Yang, Ji-Heng Zhang, Jin-Feng Sun, Simon A. Wilde

## Highlights

► Cretaceous magmatism in Southeast China related to extension. ► Zircon Hf–O isotopes show multiple sources in the origin of Cretaceous magmatism. ► Petrogenesis of Cretaceous I- and A-type granites in Southeast China. ► The role of mantle-derived magma in petrogenesis of A- and I-type granites.

## **Zirconological tracing of transition between aqueous fluid and hydrous melt in the crust: Constraints from pegmatite vein and host gneiss in the Sulu orogen**

Original Research Article

*Pages 157-174*

Wan-Cai Li, Ren-Xu Chen, Yong-Fei Zheng, Qiuli Li, Zhaochu Hu

## Highlights

► Zircon domains grown from aqueous fluid and hydrous melt are identified in pegmatite vein and host gneiss. ► The progress of dehydration melting is indicated by a genetic transition from fluid to melt in the gneiss. ► The effect of mineral crystallization is indicated by a genetic transition from melt to fluid in the pegmatite vein. ► Breakdown of hydrous minerals in the gneiss is responsible for fluid focus and crustal anatexis. ► Anatectic zircon is distinguished from magmatic zircon by a series differences in trace element composition.

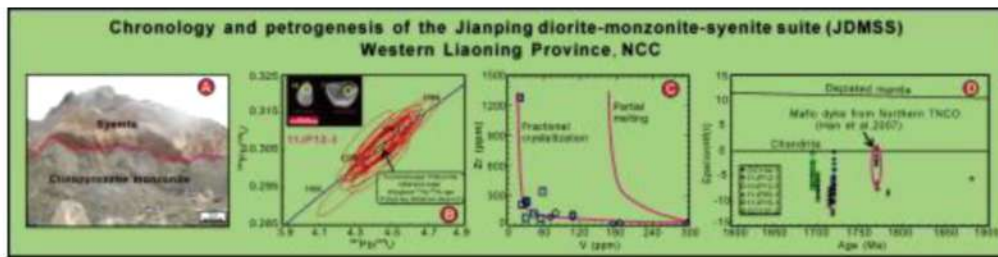
## **Geochemistry and zircon U–Pb–Hf isotopes of the late Paleoproterozoic Jianping diorite–monzonite–syenite suite of the North China Craton: Implications for petrogenesis and geodynamic setting**

Original Research Article

*Pages 175-194*

Wei Wang, Shuwen Liu, Xiang Bai, Qiugen Li, Pengtao Yang, Yue Zhao, Shuanhong Zhang, Rongrong Guo

## Graphical abstract



## Highlights

- 1696–1721 Ma diorite–monzonite–syenite suite (JDMSS) in the Western Liaoning Province.
- The JDMSS consists of magnetite diorites, clinopyroxene monzonites and (quartz) syenites.
- Fractional crystallization (plus crustal contamination) from a common parental magma. ►
- The parental magma was derived from an enriched SCLM source (mixed EMI and HIMU). ►
- These rocks were evolved in a post-collisional setting postdating the NCC amalgamation.

## The fast evolution of a crustal hot zone at the end of a transpressional regime: The Saint-Tropez peninsula granites and related dykes (Maures Massif, SE France)

Original Research Article

Pages 195-220

Jean-Clair Duchesne, Jean-Paul Liégeois, Olivier Bolle, Jacqueline Vander Auwera, Olivier Bruguière, Dmitry I. Matukov, Sergey A. Sergeev

## Highlights

- Leucogranites, diorites and dolerites intruded in a short time interval (< 3 myr). ► U–Pb zircon and monazite dating (LA-ICP-MS and SHRIMP) ► A large variety of source rocks of the magmas identified in the hot zone ► Several differentiation, hybridization and mingling processes ► Thermo-mechanical constraints on mixing and critical dyke width are calculated.

## Late-Variscan emplacement and genesis of the Vieira do Minho composite pluton, Central Iberian Zone: Constraints from U–Pb zircon geochronology, AMS data and Sr–Nd–O isotope geochemistry

Original Research Article

Pages 221-235

Helena C.B. Martins, Helena Sant’Ovaia, Fernando Noronha

## Highlights

► The NW–SE regional structures played a major role on the magma genesis. ► Magnetic fabric confirmed the control of these structures. ► Vieira do Minho pluton was emplaced at 310 Ma. ► Isotopic data point out an involvement of felsic metagneous lower crust.

### **Magma mixing in the genesis of the Kalatongke dioritic intrusion: Implications for the tectonic switch from subduction to post-collision, Chinese Altay, NW China**

Original Research Article

*Pages 236-250*

Jian-Feng Gao, Mei-Fu Zhou

#### **Highlights**

► The Kalatongke complex is composed of the dioritic and noritic suite. ► The dioritic suite results from magma mixing of mantle- and crustal-derived magmas. ► The dioritic suite is formed in a subduction environment. ► The Kalatongke complex recorded the tectonic switch from collision to extension.

### **Multiple sources for the origin of Late Jurassic Linglong adakitic granite in the Shandong Peninsula, eastern China: Zircon U–Pb geochronological, geochemical and Sr–Nd–Hf isotopic evidence**

Original Research Article

*Pages 251-263*

Liang Ma, Shao-Yong Jiang, Bao-Zhang Dai, Yao-Hui Jiang, Ming-Lan Hou, Wei Pu, Bin Xu

#### **Highlights**

► The Linglong granite was intruded at 157–160 Ma. ► The Linglong granite shows geochemical affinity with adakite. ► Abundant inherited zircons show four U–Pb age peaks (208, 750, 1800 and 2450 Ma). ► Multiple sources include lower crust of SCB and NCB, collision-related alkaline rocks, UHP metamorphic rocks.

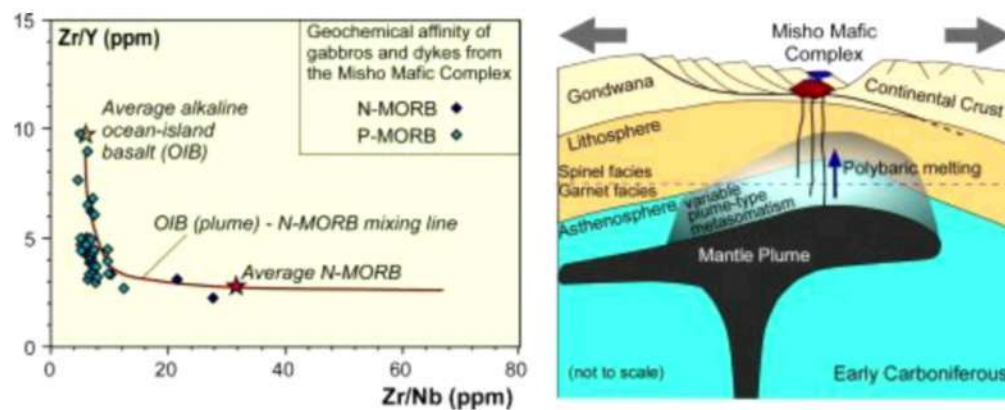
### **Geochronology and petrology of the Early Carboniferous Misho Mafic Complex (NW Iran), and implications for the melt evolution of Paleo-Tethyan rifting in Western Cimmeria**

Original Research Article

*Pages 264-278*

Emilio Saccani, Zohreh Azimzadeh, Yildirim Dilek, Ahmad Jahangiri

## Graphical abstract



## Highlights

► U–Pb zircon age reveals an Early Carboniferous age for the Misho Mafic Complex. ► The Misho Mafic Complex records the early magmatic events of Paleo-Tethys. ► Interactions between MORB-type asthenosphere and plume-type material are documented. ► Rift-drift tectonics of Paleo-Tethys was influenced by plume-type activity. ► Rift-drift tectonics of Paleo-Tethys was associated with lithospheric weakening.

## Compositionally heterogeneous podiform chromitite in the Shetland Ophiolite Complex (Scotland): Implications for chromitite petrogenesis and late-stage alteration in the upper mantle portion of a supra-subduction zone ophiolite

Original Research Article

Pages 279-300

E.J. Derbyshire, B. O'Driscoll, D. Lenaz, R. Gertisser, A. Kronz

## Highlights

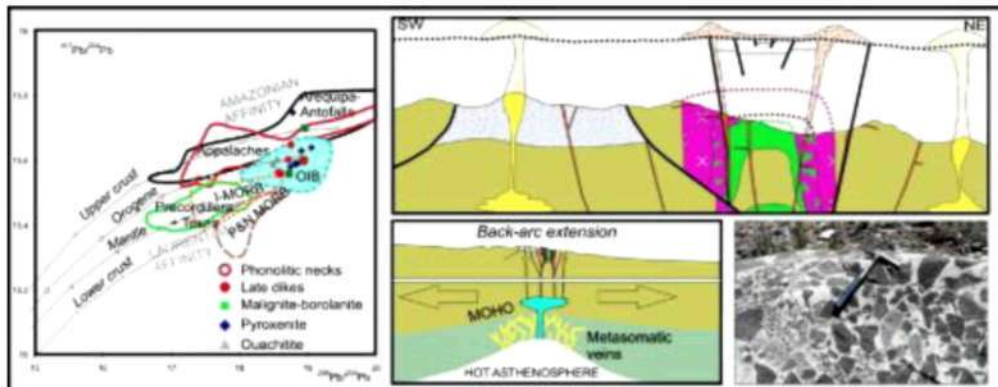
► Podiform chromitite petrogenesis in the ~ 492 Ma Shetland Ophiolite Complex (Scotland) ► Platinum-group element enrichment processes in the upper mantle ► Multiple post-magmatic alteration events preserved in chromitite seams

## Geochemical and isotopic constraints on the petrogenesis of the Puesto La Peña undersaturated potassic complex, Mendoza province, Argentina: Geodynamic implications

Original Research Article

Pages 301-316

## Graphical abstract



## Highlights

- PLPAC originates from a parental magma derived from metasomatized mantle sources.
- Sr–Nd isotope compositions follow a mantle array within the OIB field.
- Nd isotope data point to juvenile sources and multistage mantle extraction.
- Ouachitite is metasomatically enriched in radiogenic Sr and shows Sr–Nd decoupling.
- Dupal OIB signature suggest mantle modification by continental crustal material.

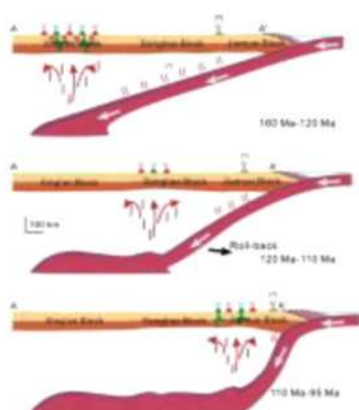
## A 100 Ma bimodal composite dyke complex in the Jiamusi Block, NE China: An indication for lithospheric extension driven by Paleo-Pacific roll-back

Original Research Article

Pages 317-330

Ming-Dao Sun, Han-Lin Chen, Feng-Qi Zhang, Simon A. Wilde, Chuan-Wan Dong, Shu-Feng Yang

## Graphical abstract



## Highlights

► A bimodal composite dyke complex is located in the Jiamusi Block, NE China. ► It indicates intra-plate extension at ~ 100 Ma. ► It supports the view that magmatism in NE China has an eastward temporal migration. ► The migration was related to roll-back of the subducted paleo-Pacific Plate.

Errata

## Erratum to “Flood basalt-related Fe–Ti oxide deposits in the Emeishan large igneous province, SW China” [Lithos 119 (2010) 123–136]

*Page 331*

Kwan-Nang Pang, Mei-Fu Zhou, Liang Qi, Gregory Shellnutt, Christina Yan Wang, Donggao Zhao

## Corrigendum to “Zircon U–Pb and garnet Lu–Hf geochronology of eclogites from the Lhasa Block, Tibet” [Lithos 155 (2012) 341–359]

*Page 332*

Hao Cheng, Chao Zhang, Jeffrey D. Vervoort, Honghua Lu, Chao Wang, Dadi Cao