



American Mineralogist

Vol. 99, No. 10

An International Journal of Earth and Planetary Materials

O

October 2014

LETTERS

- 2138 Identification of hydrogen defects linked to boron substitution in synthetic forsterite and natural olivine**
Jannick Ingrin, István Kovács, Etienne Deloule, Etienne Balan, Marc Blanchard, Simon C. Kohn and Joerg Hermann
- 2142 Densified glasses as structural proxies for high-pressure melts: Configurational compressibility of silicate melts retained in quenched and decompressed glasses**
Wim J. Malfait, Rita Seifert and Carmen Sanchez-Valle
- 2146 Geobarometry from host-inclusion systems: The role of elastic relaxation**
Ross J. Angel, Mattia L. Mazzucchelli, Matteo Alvaro, Paolo Nimis and Fabrizio Nestola

HIGHLIGHTS AND BREAKTHROUGHS

- 1817 Pauling's rules, in a world of non-spherical atoms**
Robert T. Downs
- 1818 Theoretical and applied implications of the structural order of irradiated vermiculite**
Celia Marcos
- 1820 An examination of the Ti-in-quartz thermobarometer in rocks that contain dynamically recrystallized quartz: Re-equilibration of [Ti] during recrystallization**
John M. Hughes

LUNAR HIGHLANDS REVISITED

- 1821 Visible-infrared spectral properties of iron-bearing aluminate spinel under lunar-like redox conditions**
Colin R.M. Jackson, Leah C. Cheek, Kelsey B. Williams, Kerri Donaldson Hanna, Carle M. Pieters, Stephen W. Parman, Reid F. Cooper, M. Darby Dyar, Melissa Nelms and Mark R. Salvatore
- 1834 VNIR spectral variability of the igneous stratified Stillwater Complex: A tool to map lunar highlands**
Cristian Carli, Giovanni Serventi and Maria Sgavetti

- 1849 Spinel-rich lithologies in the lunar highland crust: Linking lunar samples with crystallization experiments and remote sensing**
Juliane Gross, Peter J. Isaacson, Allan H. Treiman, Loan Le and Julia K. Gorman
- 1860 Phosphate-halogen metasomatism of lunar granulite 79215: Impact-induced fractionation of volatiles and incompatible elements**
Allan H. Treiman, Jeremy W. Boyce, Juliane Gross, Yunbin Guan, John M. Eiler and Edward M. Stolper
- 1871 Reflectance spectroscopy of plagioclase-dominated mineral mixtures: Implications for characterizing lunar anorthosites remotely**
Leah C. Cheek and Carle M. Pieters
- 1893 The distribution of Mg-spinel across the Moon and constraints on crustal origin**
Carle M. Pieters, Kerri Donaldson Hanna, Leah Cheek, Deepak Dhingra, Tabb Prissel, Colin Jackson, Daniel Moriarty, Stephen Parman and Lawrence A. Taylor

ARTICLES

- 1911 The occurrence and composition of chevkinite-(Ce) and perrierite-(Ce) in tholeiitic intrusive rocks and lunar mare basalt**
Janet R. Muhling, Alexandra A. Suvorova and Birger Rasmussen
- 1922 Garnet as a major carrier of the Y and REE in the granitic rocks: An example from the layered anorogenic granite in the Brno Batholith, Czech Republic**
Sven Höning, Renata Čopjáková, Radek Škoda, Milan Novák, David Dolejš, Jaromír Leichmann and Michaela Vašinová Galiová
- 1942 Mid-infrared optical constants of clinopyroxene and orthoclase derived from oriented single-crystal reflectance spectra**
Jessica A. Arnold, Timothy D. Glotch and Anna M. Plonka
- 1956 Time-resolved synchrotron X-ray diffraction study of the dehydration behavior of chalcophanite**
Jeffrey E. Post and Peter J. Heaney
- 1962 Ab initio investigations of dioctahedral interlayer-deficient mica: Modeling particles of illite found within gas shale**
Dawn Geatches, Douglas McCarty and Jennifer Wilcox

Vol.
99Pages
1817–
2160

(Contents continued from front cover)

- 1973 Trona at extreme conditions: A pollutant-sequestering material at high pressures and low temperatures**
Earl O'Bannon III, Christine M. Beavers and Quentin Williams
- 1985 In-situ U-Th/Pb geochronology of (urano)thorite**
John M. Cottle
- 1996 Temperature-induced amorphization of Na-zeolite A: A view from multi-nuclear high-resolution solid-state NMR**
Hyun Na Kim and Sung Keun Lee
- 2008 "Silicified" pyrochlore from nepheline syenite (mariupolite) of the Mariupol Massif, SE Ukraine: A new insight into the role of silicon in the pyrochlore structure**
Magdalena Dumańska-Słowiak, Adam Pieczka, Gioacchino Tempesta, Zbigniew Olejniczak and Wiesław Heflik
- 2018 Physio-chemical properties of gamma-irradiated vermiculite and their significance for radiation protection and thermoluminescence**
Sukhnandan Kaur, Surinder Singh and Lakhwanti Singh
- 2025 Ti resetting in quartz during dynamic recrystallization: Mechanisms and significance**
Kyle T. Ashley, William D. Carlson, Richard D. Law and Robert J. Tracy
- 2031 Thermodynamic study of monoclinic pyrrhotite in equilibrium with pyrite in the Ag-Fe-S system by solid-state electrochemical cell technique**
Dmitriy A. Chareev, Mikhail V. Voronin and Evgeniy G. Osadchii
- 2035 Phase diagram and P-V-T equation of state of Al-bearing seifertite at lowermost mantle conditions**
Denis Andrault, Reidar G. Trønnes, Zuzana Konopková, Wolfgang Morgenroth, Hanns P. Liermann, Guillaume Morard and Mohamed Mezouar
- 2043 Crystal structure of Guinier-Preston zones in orthopyroxene: Z-contrast imaging and ab initio study**
Hufang Xu, Zhizhang Shen, Hiromi Konishi and Gufeng Luo
- 2049 Crystal chemistry and surface configurations of two poly lithionite-1M crystals**
Chiara Elmi, Maria Franca Brigatti, Stephen Guggenheim, Luca Pasquali, Monica Montecchi and Stefano Nannarone
- 2060 Crystal chemistry of synthetic Ti-Mg-bearing hibonites: A single-crystal X-ray study**
Mattia Giannini, Tiziana Boffa Ballaran and Falko Langenhorst
- 2068 Mineralogy and crystal chemistry of Mn, Fe, Co, Ni, and Cu in a deep-sea Pacific polymetallic nodule**
Alain Manceau, Martine Lanson and Yoshio Takahashi
- 2084 Agakhanovite-(Y), ideally $(YCa)_2KBe_3Si_{12}O_{30}$, a new milarite-group mineral from the Heftetjern pegmatite, Tordal, Southern Norway: Description and crystal structure**
Frank C. Hawthorne, Yassir A. Abdu, Neil A. Ball, Petr Černý and Roy Kristiansen
- ACTINIDES IN GEOLOGY, ENERGY, AND THE ENVIRONMENT**
- 2089 Ichnusaite, $Th(MoO_4)_2 \cdot 3H_2O$, the first natural thorium molybdate: Occurrence, description, and crystal structure**
Paolo Orlandi, Cristian Biagiomi, Luca Bindi and Fabrizio Nestola
- 2095 Quantification of α -particle radiation damage in zircon**
Katie M. Smye, Clive Brigden, Eric R. Vance and Ian Farnan
- MARTIAN ROCKS AND SOIL**
- 2105 Spectral properties of Ca-sulfates: Gypsum, bassanite, and anhydrite**
Janice L. Bishop, Melissa D. Lane, M. Darby Dyar, Sara J. King, Adrian J. Brown and Gregg A. Swayze
- 2116 Flower-like apatite recording microbial processes through deep geological time and its implication to the search for mineral records of life on Mars**
Si Sun, Lung S. Chan and Yi-Liang Li
- 2126 Gypsum in modern Kamchatka volcanic hot springs and the Lower Cambrian black shale: Applied to the microbial-mediated precipitation of sulfates on Mars**
Min Tang, Anouk Ehreiser and Yi-Liang Li
- 2150 NEW MINERAL NAMES**
- 2159 BOOK REVIEW**



SPONSORING BENEFACTORS

- Cargille Laboratories The Hudson Institute of Mineralogy
 Excalibur Mineral Corporation Vulcan Materials—Corporate Office
 ExxonMobil Upstream Research Co. W.R. Grace & Co.
 Gemological Institute of America

CONTRIBUTING BENEFACTORS

- Blake Industries R.T. Vanderbilt Company, Inc.
 Bruker AXS Inc. (WI) The Ash Grove Charitable Foundation
 Microtrace LLC WW Norton & Company, Inc.