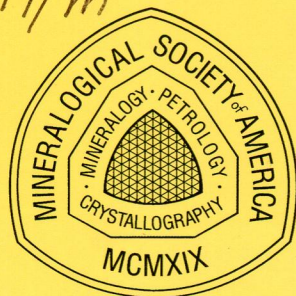


TH  
A47/m



# American Mineralogist

Vol. 98, No. 10

An International Journal of Earth and Planetary Materials

October 2013

## REVIEW PAPER

- 1633 The crystal structure and vibrational spectroscopy of jarosite and alunite minerals**  
Henry J. Spratt, Llew Rintoul, Maxim Avdeev and Wayde N. Martens

## VERSATILE MONAZITE

- 1644 Petrogenesis of the Kulyk Lake monazite-apatite-Fe(Ti)-oxide occurrence revealed using in-situ LA-(MC)-ICP-MS trace element mapping, U-Pb dating, and Sm-Nd isotope systematics on monazite**  
Christopher R.M. McFarlane and Michelle McKeough

## AMORPHOUS MATERIALS: PROPERTIES, STRUCTURE, AND DURABILITY

- 1660 Analysis of H<sub>2</sub>O in silicate glass using attenuated total reflectance (ATR) micro-FTIR spectroscopy**  
Jacob B. Lowenstern and Bradley W. Pitcher

## ARTICLES

- 1669 Unlocking the secrets of Al-tobermorite in Roman seawater concrete**  
Marie D. Jackson, Sejung R. Chae, Sean R. Mulcahy, Cagla Meral, Rae Taylor, Penghui Li, Abdul-Hamid Emwas, Juhyuk Moon, Seyoon Yoon, Gabriele Vola, Hans-Rudolf Wenk, and Paulo J.M. Monteiro
- 1688 The determination of hydrogen positions in superhydrous phase B**  
Dmytro M. Trots, Alexander Kurnosov, M. A. Geeth M. Manthilake, Sergey V. Ovsyannikov, Lev G. Akselrud, Thomas Hansen, Joseph R. Smyth and Daniel J. Frost
- 1693 Carlfrancisite: Mn<sup>2+</sup>(Mn<sup>2+</sup>,Mg,Fe<sup>3+</sup>,Al)<sub>42</sub>(As<sup>3+</sup>O<sub>3</sub>)<sub>2</sub>(As<sup>5+</sup>O<sub>4</sub>)<sub>4</sub>[(Si,As<sup>5+</sup>)O<sub>4</sub>]<sub>16</sub>[(As<sup>5+</sup>,Si)O<sub>4</sub>]<sub>2</sub>(OH)<sub>42</sub>, a new arseno-silicate mineral from the Kombat mine, Otavi Valley, Namibia**  
Frank C. Hawthorne, Yassir A. Abdu, Neil A. Ball and William W. Pinch

- 1697 Petrology and geochemistry of lunar granite 12032,366-19 and implications for lunar granite petrogenesis**

Stephen M. Seddio, Bradley L. Jolliff, Randy L. Korotev and Ryan A. Zeigler

- 1714 Extreme fractionation from zircon to hafnon in the Koktokay No. 1 granitic pegmatite, Altai, northwestern China**

Rong Yin, Ru Cheng Wang, Ai-Cheng Zhang, Huan Hu, Jin Chu Zhu, Can Rao and Hui Zhang

- 1725 Controls of *P-T* path and element mobility on the formation of corundum pseudomorphs in Paleoproterozoic high-pressure anorthosite from Sittampundi, Tamil Nadu, India**

Priyadarshi Chowdhury, Moumita Talukdar, Pulak Sengupta, Sanjoy Sanyal and Dhruba Mukhopadhyay

- 1738 Aluminum speeds up the hydrothermal alteration of olivine**

Muriel Andreani, Isabelle Daniel and Marion Pollet-Villard

- 1745 Iron pairs in beryl: New insights from electron paramagnetic resonance, synchrotron X-ray absorption spectroscopy, and ab initio calculations**

Jinru Lin, Ning Chen, Dan Huang and Yuanming Pan

- 1754 Effects of fluid and melt density and structure on high-pressure and high-temperature experimental studies of hydrogen isotope partitioning between coexisting melt and aqueous fluid**

Bjorn Mysen

- 1765 DFT simulation of the occurrences and correlation of gold and arsenic in pyrite**

Jian-Hua Chen, Yu-Qiong Li, Shui-Ping Zhong and Jin-Guo

- 1772 Crystal structure and hydration/dehydration behavior of Na<sub>2</sub>Mg(SO<sub>4</sub>)<sub>2</sub>·16H<sub>2</sub>O: A new hydrate phase observed under Mars-relevant conditions**

Kristin Leftwich, David L. Bish and C.H. Chen

- 1779 The diffusion behavior of hydrogen in plagioclase feldspar at 800–1000 °C: Implications for re-equilibration of hydroxyl in volcanic phenocrysts**

Elizabeth A. Johnson and George R. Rossman



- 1788 Quantification of dissolved CO<sub>2</sub> in silicate glasses using micro-Raman spectroscopy**  
Yann Morizet, Richard A. Brooker, Giada Iacono-Marziano and Bruce A. Kjarsgaard
- 1803 Spin transition of Fe<sup>2+</sup> in ringwoodite (Mg,Fe)<sub>2</sub>SiO<sub>4</sub> at high pressures**  
Igor S. Lyubutin, Jung-Fu Lin, Alexander G. Gavriluk, Anna A. Mironovich, Anna G. Ivanova, Vladimir V. Roddatis and Alexander L. Vasiliev
- 1811 P-V-T relations of  $\gamma$ -Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> tuite determined by in situ X-ray diffraction in a large-volume high-pressure apparatus**  
Shuangmeng Zhai, Daisuke Yamazaki, Weihong Xue, Lijin Ye, Chaowen Xu, Shuangming Shan, Eiji Ito, Akira Yoneda, Takashi Yoshino, Xinzhuan Guo, Akira Shimojuku, Noriyoshi Tsujino and Ken-Ichi Funakoshi
- 1817 Bonding and electronic changes in rhodochrosite at high pressure**  
Gabriela A. Farfan, Eglantine Boulard, Shibing Wang and Wendy L. Mao
- 1824 Growth of calcium carbonate in the presence of Se(VI) in silica hydrogel**  
Ángeles Fernández-González and Lurdes Fernández-Díaz
- 1834 Thermodynamic properties of saponite, nontronite, and vermiculite derived from calorimetric measurements**  
Hélène Gailhanou, Philippe Blanc, Jacques Rogez, Georges Mikaelian, Katsuya Horiuchi, Yasuhisa Yamamura, Kazuya Saito, Hitoshi Kawaji, Fabienne Warmont, Jean-Marc Grenèche, Philippe Vieillard, Claire I. Fialips, Eric Giffaut and Eric C. Gaucher
- 1848 Far-infrared spectra of synthetic dioctahedral muscovite and muscovite-tobelite series micas: Characterization and assignment of the interlayer I-O<sub>inner</sub> and I-O<sub>outer</sub> stretching bands**  
Kiyotaka Ishida and Frank C. Hawthorne
- 1860 Phosphorus partitioning between olivine and melt: An experimental study in the system Mg<sub>2</sub>SiO<sub>4</sub>-Ca<sub>2</sub>Al<sub>2</sub>Si<sub>2</sub>O<sub>9</sub>-NaAlSi<sub>3</sub>O<sub>8</sub>-Mg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>**  
Thomas B. Grant and Simon C. Kohn
- 1870 Olivine from spinel peridotite xenoliths: Hydroxyl incorporation and mineral composition**  
Esther Schmädicke, Jürgen Gose, Gudrun Witt-Eickschen and Helene Brätz
- 1881 Determination of the melting temperature of kaolinite by means of the Z-method**  
Brahim K. Benazzouz, Ali Zaoui and Anatoly B. Belonoshko
- 1886 Darrellhenryite, Na(LiAl<sub>2</sub>)Al<sub>6</sub>(BO<sub>3</sub>)<sub>3</sub>Si<sub>6</sub>O<sub>18</sub>(OH)<sub>3</sub>O, a new mineral from the tourmaline supergroup**  
Milan Novák, Andreas Ertl, Pavel Povondra, Michaela Vašinová Galiová, George R. Rossman, Helmut Pristacz, Markus Prem, Gerald Giester, Petr Gadas and Radek Škoda
- 1893 Nizamoffite, Mn<sup>2+</sup>Zn<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>(H<sub>2</sub>O)<sub>4</sub>, the Mn analogue of hopeite from the Palermo No. 1 pegmatite, North Groton, New Hampshire**  
Anthony R. Kampf, Alexander U. Falster, William B. Simmons and Robert W. Whitmore
- 1899 Mcalpineite from the Gambatesa mine, Italy, and redefinition of the species**  
Cristina Carbone, Riccardo Basso, Roberto Cabella, Alberto Martinelli, Joel D. Grice and Gabriella Lucchetti
- 1906 Rossiantonite, Al<sub>3</sub>(PO<sub>4</sub>)(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>2</sub>(H<sub>2</sub>O)<sub>10</sub>·4H<sub>2</sub>O, a new hydrated aluminum phosphate-sulfate mineral from Chimanta massif, Venezuela: Description and crystal structure**  
Ermanno Galli, Maria Franca Brigatti, Daniele Malferrari, Francesco Sauro and Jo De Waele
- 1914 BOOK REVIEW**
- 1915 BOOK REVIEW**
- 1916 ERRATUM**



GeoScienceWorld

Participating Publisher

**SPONSORING BENEFACTORS**

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

**CONTRIBUTING BENEFACTORS**

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