



# American Mineralogist

Vol. 106, No. 4

International Journal of Earth and Planetary Materials Research

April 2021

**LETTERS**

- 662 **Nitrogen diffusion in silicate melts under reducing conditions**  
Julien Boulliang, Célia Dalou, Laurent Tissandier, Evelyn Füre, and Yves Marrochi

**SPECIAL COLLECTION: UNDERSTANDING PALEO-OCEAN PROXIES: INSIGHTS FROM IN SITU ANALYSES**

- 497 **Gamma-enhancement of reflected light images: A rapid, effective tool for assessment of compositional heterogeneity in pyrite**  
QiaoQiao Zhu, Nigel J. Cook, GuiQing Xie, Cristiana L. Ciobanu, Wei Jian, Benjamin P. Wade, and Jing Xu

**SPECIAL COLLECTION: ORIGINS OF OUR SOLAR SYSTEM AND ITS ORGANIC COMPOUNDS**

- 506 **Thermal metamorphic history of Antarctic CV3 and CO3 chondrites inferred from the first- and second-order Raman peaks of polyaromatic organic carbon**  
Mehmet Yesiltas, Jordan Young, and Timothy D. Glotch

**SPECIAL COLLECTION: EXPERIMENTAL AND PETROLOGIC INVESTIGATION OF HALOGENS, SULFUR, AND OTHER VOLATILE SPECIES IN IGNEOUS SYSTEMS IN HONOR OF JIM WEBSTER**

- 518 **A quantitative description of fission-track etching in apatite**  
Carolyn Aslanian, Raymond Jonckheere, Bastian Wauschkuhn, and Lothar Ratschbacher

**ARTICLES**

- 527 **Spectroscopic analysis of allophane and imogolite samples with variable Fe abundance for characterizing the poorly crystalline components on Mars**  
Thomas Jeute, Leslie L. Baker, Janice L. Bishop, Zaenal Abidin, and Elizabeth B. Rampe
- 541 **Relationship between  $^{207}\text{Pb}$  NMR chemical shift and the morphology and crystal structure for the apatites  $\text{Pb}_5(\text{AO}_4)_3\text{Cl}$ , vanadinite ( $\text{A} = \text{V}$ ), pyromorphite ( $\text{A} = \text{P}$ ), and mimetite ( $\text{A} = \text{As}$ )**  
Otto E.O. Zeman, Rupert Hochleitner, Wolfgang W. Schmahl, Konstantin Karaghiosoff, and Thomas Bräuniger
- 549 **Effect of cationic substitution on the pressure-induced phase transitions in calcium carbonate**  
Naira S. Martirosyan, Ilias Efthimiopoulos, Lea Pennacchioni, Richard Wirth, Sandro Jahn, and Monika Koch-Müller

- 559 **Immiscible-melt inclusions in corundum megacrysts: Microanalyses and geological implications**

Xi-Sheng Xu, Xiao-Ming Chen, William L. Griffin, Suzanne Y. O'Reilly, Xi-Song Zhang, and Li-Hui Chen

- 570 **Water quantification in olivine and wadsleyite by Raman spectroscopy and study of errors and uncertainties**

Lois Martinek and Nathalie Bolfan-Casanova

- 581 **High-pressure and high-temperature vibrational properties and anharmonicity of carbonate minerals up to 6 GPa and 500 °C by Raman spectroscopy**

Stefan Farsang, Remo N. Widmer, and Simon A.T. Redfern

- 599 **Vanadium-induced coloration in grossite ( $\text{CaAl}_4\text{O}_7$ ) and hibonite ( $\text{CaAl}_{12}\text{O}_{19}$ )**

Matteo Ardit, Fernando Cámara, and Ulf Hälenius

- 609 **Incorporation mechanism of tungsten in W-Fe-Cr-V-bearing rutile**

Juraj Majzlan, Ralph Bolanz, Jörg Göttlicher, Tomáš Mikuš, Stanislava Milovská, Mária Čaplovičová, Martin Števko, Christiane Rössler, and Christian Matthes

- 620 **Titanium diffusion profiles and melt inclusion chemistry and morphology in quartz from the Tshirege Member of the Bandelier Tuff**

Joseph R. Boro, John A. Wolff, Owen K. Neill, Arron R. Steiner, and Frank C. Ramos

- 633 **Vasilveerginite,  $\text{Cu}_9\text{O}_4(\text{AsO}_4)_2(\text{SO}_4)_2$ , a new fumarolic mineral with a hybrid structure containing novel anion-centered tetrahedral structural units**

Igor V. Pekov, Sergey N. Britvin, Sergey V. Krivovichev, Vasilij O. Yapaskurt, Marina F. Vigasina, Anna G. Turchkova, and Evgeny G. Sidorov

- 641 **Priscillagrewite-(Y),  $(\text{Ca}_2\text{Y})\text{Zr}_2\text{Al}_3\text{O}_{12}$ : A new garnet of the bitikleite group from the Daba-Siwaqa area, the Hatrurim Complex, Jordan**

Irina Galuskina, Evgeny Galuskin, Yevgeny Vapnik, Grzegorz Zeliński, and Krystian Prusik

- 650 **Stöfflerite,  $(\text{Ca},\text{Na})(\text{Si},\text{Al})_4\text{O}_8$  in the hollandite structure: A new high-pressure polymorph of anorthite from martian meteorite NWA 856**

Oliver Tschauer, Chi Ma, John G. Spray, Eran Greenberg, and Vitali B. Prakapenka

- 656 **Recycled volatiles determine fertility of porphyry deposits in collisional settings**

Bo Xu, Zeng-Qian Hou, William L. Griffin, Yongjun Lu, Elena Belousova, Ji-Feng Xu, and Suzanne Y. O'Reilly

- 667 **BOOK REVIEW**