

*CURRICULUM VITAE*

**MIKHAIL Yu. ZOLOTOV**

School of Earth and Space Exploration  
Arizona State University, Tempe, AZ 85287-1404  
tel. (480) 965-4739; fax. (480) 965-8102; E-mail: zolotov@asu.edu  
<http://zolotov.faculty.asu.edu/main.html>

- Education:** Moscow State University, Moscow, Diploma in Geochemistry, 1982
- Vernadsky Institute of Geochemistry and Analytical Chemistry, USSR Academy of Sciences, Candidate of Science (Ph. D.), Geochemistry, 1990
- Employment:** July 2006 – present  
Associate Research Professor, School of Earth and Space Exploration,  
Arizona State University
- June 2002 – July 2006:  
Faculty Research Associate, Department of Geological Sciences,  
Arizona State University
- 1997 – June 2002:  
Senior Research Scientist, Department of Earth and Planetary Sciences,  
Washington University in St. Louis, Missouri
- 1992 – 1998:  
Senior Research Scientist, Vernadsky Institute of Geochemistry and Analytical  
Chemistry, Russian Academy of Sciences, Moscow. From 1991 to 1996, Deputy  
Director of the Laboratory of Comparative Planetology and Meteoritics,  
Vernadsky Institute
- 1985 – 1992:  
Junior Research Scientist, Vernadsky Institute of Geochemistry and Analytical  
Chemistry, Russian Academy of Sciences, Moscow
- Visiting  
Appointments:** January 2001 – March 2001:  
Visiting Investigator, Department of Marine Chemistry and Geochemistry, Woods  
Hole Oceanographic Institution, Massachusetts
- September 1996 – December 1996:  
Visiting Scientist, Department of Earth and Planetary Sciences,  
Washington University in St. Louis, Missouri
- February 1996 – May 1996:  
Visiting Scientist, Department of Earth and Planetary Physics, Tokyo State  
University, Tokyo, Japan
- November 1992 – March 1993:  
Visiting Scientist, Department of Geology, Arizona State University, Tempe,  
Arizona

**Research interests:** Theoretical geochemistry of volatiles (H, O, C, N, S, Cl, and alkalis) on solar system bodies:

- gas-water-mineral type chemical interactions on Venus, Mars, icy satellites and parent bodies of chondrites (asteroids)
- formation and chemical evolution of oceans on icy satellites
- chemical weathering of rocks on Venus and Mars
- oxidation states of planetary surfaces, asteroids, and icy satellites
- geochemistry of planetary volcanic gases and hydrothermal systems

**Grants, fellowships and awards**

*Current research grants:*

Principal Investigator, NASA Planetary Geology/Geophysics Program grant, 2008-2011.

Principal Investigator, NASA Mars Fundamental Research grant, 2007-2010.

Principal Investigator, NASA Cosmochemistry grant, 2007-2010

Principal Investigator, NSF Planetary Astronomy research grant, 2005-2008

Principal Investigator, NASA Outer Planets Research grant, 2005-2008

Co-Investigator, NASA Exobiology and Evolutionary Biology grant, 2005-2008

*Previous grants/awards:*

Principal Investigator, NASA Mars Fundamental Research grant, 2006

Principal Investigator, NASA Origins research grant, 2004-2007

NASA Space Grant at ASU (for mentoring undergraduate interns), 2005-2006

Japan Society for the Promotion of Science (JSPS) research fellowship, 1996

Principal Investigator, Russian Foundation for Basic Research grant, 1994

Co-PI, NATO Research Collaborative grant, 1996

Co-PI, Arizona State University – Vernadsky Institute subgrant, 1992-1993

Co-Investigator, NASA Exobiology grant, 2002-2005

Co-Investigator, International Science Foundation grant, 1993-1994

Co-Investigator, Arizona State University – Vernadsky Inst. Sci. Contract, 1990

Vernadsky Institute Award for the Liquidation of the Chernobyl Nuclear Plant Disaster, 1987

Vernadsky Institute “Board of Honor” award, 1986

**Professional societies:**

American Geophysical Union

Meteoritical Society

**Professional activities and service:**

Science panel member for the NASA Discovery Program

Scientific reviews of funding research proposals for the NASA Cosmochemistry, Origins of the Solar Systems, Mars Fundamental Research, Planetary Geology and Geophysics, Cassini Data Analysis, Exobiology and Evolutionary Biology programs, National Science Foundation, and The Petroleum Research Fund, American Chemical Society

Organizer of the *Topics in Mineralogy of the Solar System* (2006-2007 with S. Ruff) and the *Martian Mineralogy* (2004-2005, with P. Niles) seminar series at ASU.

Scientific reviews for *Science*, *Nature*, *Geochimica et Cosmochimica Acta*, *Journal of Geophysical Research*, *Icarus*, *Meteoritics and Planetary Science*, *Chemical Geology*, *Astrobiology*, and *Deep Sea Research*.

Member of advisory committees of A. McAdam and G. Glein (ASU, 2007)

Scientific secretary, 18-th Russian-American Working Meeting on Planetology, (Vernadsky-Brown Microsymposium), Moscow, 1993

Head, Counsel of Junior Scientists, Vernadsky Institute, 1988-1989

Scientific secretary, First All-Soviet Union Symposium on Thermodynamics in Geology, Suzdal', USSR, March 1985

**Major Oral Presentations and Lectures**

*Invited:*

Lunar and Planetary Institute, Houston, 2006

Planetary Science Institute, Tucson, 2006

*AGU Chapman Conf. on Venus as a Terrestrial Planet*, Key Largo, FL, 2006

*American Geophysical Union Fall Meetings*, 1996, 2005 (2 invited)

Moscow State University, Geochemistry department, 2004

Marine Biological Laboratory at Woods Hole, 2001

University of Washington, Seattle, Astrobiology Program, 2000

St. Louis Astronomical Society, 2000

*Experimental Mineralogy, Petrology, and Geochemistry*, Moscow, 1994

USSR Mineralogical Society, Annual Meeting, Leningrad, 1988

**Major Oral Presentations and Lectures (continuation)**

**Other oral talks:**

*Lunar and Planetary Science Conferences*, Houston, TX, 1999-2007  
*Annual Meetings of the Meteoritical Society*, 2003-2005  
*American Geophysical Union, Fall meetings*, 1996, 1998, 2002, 2004, 2005  
*Astrobiology Science Conferences*, 2000, 2006  
*Vernadsky-Brown Micro-symposia*, 1986-1989, 1991, 1995, 2002  
*Workshop on Ices, Oceans, and Fire: Satellites of the Outer Solar System*, 2007  
*Enceladus Focus Group Meeting II*, 2007  
*Europa Focus Group Meeting V*, 2006  
*Oxygen in Asteroids and Meteorites*, 2005  
*Second Conference on Early Mars*, 2004  
*Origin of Earth and Moon*, 1998  
*Scientific Conference for Mars Exploration*, Bud Honnef, Germany, 1992  
*Internat. Workshop: Engineering Model of Mars Environment*, Hungary, 1990  
*Fourth International Conference on Mars*, 1989  
Department of Geological Sciences/SESE, Arizona State Univ., 1990, 2004-2006  
Department Earth and Planetary Sci., Washington Univ., 1997, 1999, 2000, 2002  
Vernadsky Institute, Moscow, 1984, 1987, 1988, 1990, 1994, 1998  
Woods Hole Oceanographic Institution, Marine Chemistry & Geochemistry, 2000  
Brown University, Planetary Geology Group, 2000  
University of Tokyo, Department of Earth and Planetary Physics, 1996  
Institute of Raumsimulation (DLR), Cologne, Germany, 1992

**Teaching**

*Planetary Geochemistry*, offered for 2008, ASU  
*Oceans and the Atmosphere*, Washington University in St. Louis, 2001 and 2002

**Advising/ supervision**

Advising undergraduate student/worker (Michelle Krieg) 2005-2006  
Advising graduate student Amy McAdam at ASU, 2005-2008 (co-adviser).  
Advising graduate student Christopher Glein at ASU, 2006-present (co-adviser).  
Supervision of a consultant work (Mikhail Mironenko, Vernadsky Institute) at ASU, 2004-2008.

**Publications**

Peer reviewed publications: 42 (+2 in review); Book: 1; Abstracts: 116

## Publications of Mikhail Zolotov

### Submitted manuscripts:

44. Mironenko, M. V., and **Zolotov, M. Yu.**, A kinetic-equilibrium model for water-rock interactions in closed low temperature systems. *Applied Geochemistry*, submitted.
43. **Zolotov, M. Yu.**, and Kargel, J. S. Composition of Europa's Icy Shell, Ocean and Underlying Rocks. In *Europa* (R. Pappalardo, W. B. McKinnon, and K. Khurana, eds.). Univ. of Arizona Press, Tucson, in review.

### Peer reviewed publications:

42. \*McAdam, A. C., **Zolotov, M. Yu.**, Mironenko, M. V., and \*\*Sharp, T. G. (2008) Formation of Silica by Low-Temperature Acid Alteration of Martian Rocks. *Journal of Geophysical Research [Planets]*, in press.
41. \*Glein, C. R., **Zolotov, M. Yu.**, and \*\*Shock, E. L. (2008) Oxidation State of Hydrothermal Fluids on Early Enceladus. *Icarus* **197**, in press.
40. \*McAdam, A. C., **Zolotov, M. Yu.**, Leshin, L. A., and \*\*Sharp, T. G. (2008) Preferential Low-pH Dissolution of Pyroxene in Plagioclase-Pyroxene Mixtures: Implications for Martian Surface Materials. *Icarus* **196**, 90-96.
39. **Zolotov, M. Yu.** (2007) An Oceanic Composition on Early and Today's Enceladus. *Geophysical Research Letters* **34**, L23203, doi: 10.1029/2007GLG031234.
38. **Zolotov, M. Yu.**, and Mironenko, M. V. (2007) Timing of Acid Weathering on Mars: A Kinetic-Thermodynamic Assessment. *Journal of Geophysical Research [Planets]* **112**, E07006, doi:10.1029/2006JE002882.
37. **Zolotov, M. Yu.** (2007) Atmosphere-Surface Interactions, Schubert G. (ed.), *Treatise on Geophysics*. Volume 10, pp. 349-370, Oxford: Elsevier Ltd. doi:10.1016/B978-044452748-6/00181-4.
36. **Zolotov, M. Yu.**, Mironenko, M. V., and \*\*Shock, E. L. (2006) Thermodynamic Constraints on Fayalite Formation on Parent Bodies of Chondrites. *Meteoritics and Planetary Science* **41**(11), 1775-1796.
35. Owen, T. C., Niemann, H., Atreya, S., and **Zolotov, M. Y.** (2006) Between Heaven and Earth: The Exploration of Titan. *Faraday Discussions* **133**, 387-391.
34. Seewald, J., **Zolotov, M. Yu.**, and McCollom, T. (2006) Experimental Investigation of Carbon Speciation under Hydrothermal Conditions. *Geochimica et Cosmochimica Acta* **70**, 446-460.
33. **Zolotov, M. Yu.**, and \*\*Shock, E. L. (2005) Formation of Jarosite-bearing Deposits Through Aqueous Oxidation of Pyrite at Meridiani Planum, Mars. *Geophysical Research Letters* **32**, No. 21, L21203, doi: 10.1029/2005 GL024253.
32. **Zolotov, M. Y.**, and \*\*Shock, E. L. (2004) A Model for Low-Temperature Biogeochemistry of Sulfur, Carbon, and Iron on Europa. *J. Geophysical Research [Planets]* **109**, E06003, doi: 10.1029/2003JE002194.
31. Kargel, J. S., Carlson, R. W., Davies, A. G., Fegley, B., Gillespie, A., \*\*Greeley, R., Howell, R. R. Jessup, K. L., Kamp, L., Keszthelyi, L. P., Lopes, R. M., MacIntyre, T.J., Marchis, F., McEwen, A. S., Milazzo, M., Perry, J., Radebaugh, J., Schaefer, L., \*Schmerr, N., Smythe, D. W., Spencer, J. R., \*\*Williams, D. A., Zhang, J., and **Zolotov, M. Yu.** (2003) Extreme Volcanism on Io: Latest Insights at the End of Galileo Era. *Eos, Transactions, Amer. Geophysical Union*, **84**, No. 33, 113, 318.
30. **Zolotov, M. Y.**, and \*\*Shock, E. L. (2003) Energy for Biologic Sulfate Reduction in a Hydrothermally Formed Ocean on Europa. *Journal of Geophysical Research, [Planets]* **108**, E4, 5022, doi: 10.1029/2002JE001966.
29. Moses, J. I., **Zolotov, M. Yu.**, and Fegley, B., Jr. (2002) Alkali and Chlorine Photochemistry in a Volcanically Driven Atmosphere on Io. *Icarus* **156**, 107-135.
28. Moses, J. I., **Zolotov, M. Yu.**, and Fegley, B., Jr. (2002) Photochemistry of a Volcanically Driven Atmosphere on Io: Sulfur and Oxygen Species from a Pele-type Eruption. *Icarus* **156**, 76-106.
27. **Zolotov, M. Yu.**, and Shock, E. L. (2001) Composition and Stability of Salts on the Surface of Europa and their Oceanic Origin. *Journal of Geophysical Research, [Planets]* **106**, 32815-32828.

\* Student's work

\*\* ASU Co-author

26. **Zolotov, M. Yu.**, and Shock, E. L. (2001) Stability of Condensed Hydrocarbons in the Solar Nebula. *Icarus* **150**, 323-337.
25. Fegley, B., Jr., and **Zolotov, M. Yu.** (2000) Chemistry of Sodium, Potassium and Chlorine in Volcanic Gases on Io. *Icarus* **148**, 193-210.
24. Shock, E. L., Amend J. P., and **Zolotov, M. Y.** (2000) The Early Earth vs. the Origin of Life. In *Origin of the Earth and Moon* (R. Canup and K. Righter, Eds.), pp. 527-543, Univ. of Arizona Press, Tucson.
23. **Zolotov, M. Yu.**, and Fegley, B., Jr. (2000) Eruption Conditions of Pele Volcano on Io Inferred from Chemistry of its Volcanic Plume. *Geophysical Research Letters* **27**, 2789-2792.
22. **Zolotov, M. Yu.**, and Shock, E. L. (2000) An Abiotic Origin for Hydrocarbons in the Allan Hills 84001 Martian Meteorite Through Cooling of Magmatic and Impact-Generated Gases. *Meteoritics and Planetary Science* **35**, 629-638.
21. **Zolotov, M. Yu.**, and Shock, E. L. (2000) A Thermodynamic Assessment of the Potential Synthesis of Condensed Hydrocarbons During Cooling and Dilution of Volcanic Gases. *Journal of Geophysical Research, [Solid Earth]* **105**, 539-559.
20. **Zolotov, M. Yu.**, and Fegley, B., Jr. (1999) The Oxidation State of Volcanic Gases and Interior of Io. *Icarus* **141**, 40-52.
19. **Zolotov, M.**, and Shock, E. (1999) Abiotic Synthesis of Polycyclic Aromatic Hydrocarbons on Mars. *Journal of Geophysical Research, [Planets]* **104**, 14033-14049.
18. **Zolotov, M. Yu.**, Fegley, B., Jr., and Lodders, K. (1999) Stability of Micas on the Surface of Venus. *Planetary and Space Science* **47**, 245-260.
17. **Zolotov, M. Yu.**, and Fegley, B., Jr. (1998) Volcanic Origin of Disulfur Monoxide (S<sub>2</sub>O) on Io. *Icarus* **133**, 293-297.
16. **Zolotov, M. Yu.**, and Fegley, B., Jr. (1998) Volcanic Production of Sulfur Monoxide (SO) on Io. *Icarus* **132**, 431-434.
15. **Zolotov, M. Yu.**, Fegley, B., Jr., and Lodders, K. (1997) Hydrous Silicates and Water on Venus. *Icarus* **130**, 475-494.
14. Fegley, B., Jr., **Zolotov, M. Yu.**, and Lodders, K. (1997) The Oxidation State of the Lower Atmosphere and Surface of Venus. *Icarus* **125**, 416-439.
13. **Zolotov, M. Yu.** (1996) A Model for the Thermal Equilibrium of the Surface Venusian Atmosphere. *Geochemistry International* **33**, No. 10, 80-100.
12. Komada, N., Moecher, D. P., Westrum, E., Jr., Hemingway, B. S., **Zolotov, M. Yu.**, Semenov, Yu. V., and Khodakovskiy I. L. (1996) Thermodynamic Properties of Scapolites ranging from 10 K to 1000 K. *J. Chemical Thermodynamics* **28**, 941-973.
11. Komada, N., Westrum, E., Jr., Hemingway, B. S., **Zolotov, M. Yu.**, Semenov, Yu. V., Khodakovskiy, I. L., and Anovitz, L. M. (1995) Thermodynamic Properties of Sodalite at Temperatures from 15 K to 1000 K. *J. Chemical Thermodynamics* **27**, 1119-1132.
10. Surkov, Yu. A., Moskaleva, L. P., **Zolotov, M. Yu.**, Kharykova, V. P., Manvelyan, O. S., Smirnov, G. G., and Golovin, A. V. (1994) Phobos-2 Data on Martian Surface Geochemistry. *Geochemistry International* **31**, No. 10, 50-58.
9. **Zolotov, M. Yu.**, and Volkov, V. P. (1992) Chemical Processes on the Planetary Surface. In *Venus Geology, Geochemistry and Geophysics*. (V. L. Barsukov *et al.*, Eds.), Univ. of Arizona Press, Tucson, 177-199.
8. Gooding, J. L., Arvidson, R. E., and **Zolotov, M. Yu.** (1992) Physical and Chemical Weathering. In *Mars*, (H. Kieffer, B. Jakosky, C. Snyder, and M. Matthews, Eds.), Univ. of Arizona Press, Tucson, 626-651.
7. **Zolotov, M. Yu.**, and Khodakovskiy, I. L. (1989) Chemical Weathering. In *Planet Venus: Atmosphere, Surface, Interior Structure*, (V. L. Barsukov, and V. P. Volkov, Eds.), Nauka, Moscow, 262-278, (in Russian).
6. **Zolotov, M. Yu.** (1989) Chemical Weathering on Venus and Mars: Similarities and Differences. In *Cosmochemistry and Comparative Planetology*, (V. L. Barsukov, Ed.), 71-80, Nauka, Russian Academy of Sciences, Moscow, (in Russian).

5. Volkov, V. P., **Zolotov, M. Yu.**, and Khodakovsky, I. L. (1986) Lithospheric-Atmospheric Interaction on Venus. In *Chemistry and Physics of Terrestrial Planets*, (S. Saxena, Ed.), Springer-Verlag, New York, e.a., 136-190.
4. Sidorov, Yu. I., and **Zolotov, M. Yu.** (1986) Weathering of Martian Surface Rocks. In *Chemistry and Physics of Terrestrial Planets*, (S. Saxena, Ed.), Springer-Verlag, New York, e.a., 191-223.
3. Barsukov, V. L., Borunov, S. P., Volkov, V. P., Dorofeeva V. A., **Zolotov, M. Yu.**, Parot'kin, C. V., Semenov, Yu. V., Shapkin, A. I., Sidorov, Yu. I. and Khodakovsky, I. L. (1986) Mineral Composition of Venus soil at Venera 13, Venera 14 and Vega 2 Landing Sites According to Thermodynamic Calculations. *Doklady Akademii Nauk USSR* **287**, (2), 415-417, (in Russian, English translation: *Doklady, Earth Sciences Section*).
2. **Zolotov, M. Yu.** (1986) Geochemical Structure of Major Layering of the Ioko-Dovyren Dunitite-Troctholite-Gabbro-Norite Intrusion (Northern Baikal Region). *Reg. Geol. Nek. Raionov SSSR* **7**, Moscow University, 18-23, (in Russian).
1. **Zolotov, M. Yu.** (1983) Distribution of Copper, Zinc, Nickel, Chromium, Titanium, and Silver in Rocks of the Large Tolbachik Fracture Eruption 1975-76 (Kamchatka [USSR]). *Reg. Geol. Nek. Raionov SSSR* **6**, Moscow University, 63-67, (in Russian).

**Book:**

Sidorov, Yu. I., and **M. Yu. Zolotov** (1989) *Rocks and Soil of the Martian Surface*. Nauka: Russian Academy of Sciences, Moscow, 224 pp. (in Russian with English summary and table of contents).

**Abstracts:**

116. **Zolotov, M. Yu.**, and Mironenko, M. V. (2008) Aqueous Alteration of CM2 Chondrites Evaluated with Kinetic Models. *Meteoritics & Planetary Sciences*, 43, Suppl.
115. M. V. Mironenko, Melikhova T. Yu., **Zolotov, M. Yu.**, and Akinfiev, N. N. (2008) GEOCHEQ\_M: Program complex for thermodynamic and kinetic modeling of geochemical processes in rock-water-gas systems. Version 2008. *Seminar of experimentalists*, Moscow, Vernadsky Institute.
114. \*McAdam, A. C., **Zolotov, M. Yu.**, Mironenko, M. V., and \*\*Sharp, T. G. (2008) Formation of Martian Silica-Rich Deposits Through Rock Alteration: A Theoretical Assessment. *XXXIX Lunar and Planet. Sci.* [CD-ROM], abstract 2371.
113. **Zolotov, M. Yu.** (2008) Oceanic Composition on Europa: Constraints from Mineral Solubilities. *XXXIX Lunar and Planet. Sci.* [CD-ROM], abstract 2349.
112. **Zolotov, M. Yu.**, and Mironenko, M. V. (2008) Early Alteration of Matrices in Parent Bodies of CI/CM Carbonaceous Chondrites: Kinetic-Thermodynamic Modeling. *XXXIX Lunar and Planet. Sci.* [CD-ROM], abstract 1998.
111. \*McAdam, A. C., **Zolotov, M. Yu.**, Mironenko, M. V., and \*\*Sharp, T. G. (2007) Formation of Silica Deposits on Mars by Acid Weathering: Physical-Chemical Constraints. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., abstract P11A-0255.
110. Mironenko, M. V., and **Zolotov, M. Yu.** (2007) Aqueous Oxidation of Hydrogen Sulfide as a Cause of Acid Rock Alteration on Mars. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., abstract P11C-0706.
109. **Zolotov, M. Yu.** (2007) Organic History and Ice-Rock Decoupling on Enceladus, *Eos Trans. AGU*, 88(52) Fall Meet. Suppl., abstract P21B-0540.
108. **Zolotov, M. Yu.** (2007) Water-Rock Interactions and Oceanic Chemistry on Enceladus. *Enceladus Focus meeting, II*, August 2007, Boulder, CO, [https://encfg.ciclops.org/meeting\\_registration.php](https://encfg.ciclops.org/meeting_registration.php).
107. **Zolotov, M. Yu.**, and Mironenko, M. V. (2007) Chemical Evolution on an Early Ocean on Europa: A Kinetic-Thermodynamic Modeling. In *Workshop on Ices, Oceans, and Fire: Satellites of the Outer Solar System*, 157-158. LPI Contribution No. 1357, Lunar and Planetary Institute, Houston.
106. **Zolotov, M. Yu.**, Mironenko, M. V., \*Glein, C. R., and \*\*Shock, E. L. (2007) The Formation and Nature of Early Oceans on Icy Satellites: Geochemical Constraints. In *Workshop on Ices, Oceans, and Fire: Satellites of the Outer Solar System*, 159-160. LPI Contribution No. 1357, Lunar and Planetary Institute, Houston.

105. **Zolotov, M. Yu.**, Mironenko, M. V., and \*Krieg, M. L. (2007) Evaluation of Pressure during Aqueous Alteration and Metamorphism of Asteroids, *Meteoritics and Planetary Science* **42**, Suppl., A171.
104. **Zolotov, M. Yu.**, and Mironenko, M. V. (2007) Formation and Fate of Phyllosilicates on the Surface of Mars: Geochemical Modeling of Aqueous Weathering, *Seventh International Conf. on Mars* [CD-ROM], abstract 3365.
103. **Zolotov, M. Yu.**, and Mironenko, M. V. (2007) Hydrogen Chloride as a Source of Acid Fluids in Parent Bodies of Chondrites, *XXXVIII Lunar and Planet. Sci.* [CD-ROM], abstract 2340.
102. \*McAdam, A. C., **Zolotov, M. Yu.**, and Mironenko, M. V., and \*\*Sharp, T. G. (2007) Acid Weathering of Basaltic Lithologies: Equilibrium Modeling and Applications to Mars, *XXXVIII Lunar and Planet. Sci.* [CD-ROM], abstract 2198.
101. \*McAdam, A. C., **Zolotov, M. Yu.**, Mironenko, M. V., and \*\*Sharp, T. G. (2007) Preferential Low-pH Dissolution of Pyroxene in Plagioclase-Pyroxene Mixtures and Implications for Martian Low-Albedo Regions, *XXXVIII Lunar and Planet. Sci.* [CD-ROM], abstract 1871.
100. Mironenko, M. V. and **Zolotov, M. Yu.** (2007) Timing of Acid Weathering and Oxidation on Mars, *XXXVIII Lunar and Planet. Sci.* [CD-ROM], abstract 1594.
99. **Zolotov, M. Yu.** (2007) Origin of Acid Fluids on Mars: Impacts vs. Volcanism, *XXXVIII Lunar and Planet. Sci.* [CD-ROM], abstract 1343.
98. \*Glein, C. R., **Zolotov, M. Yu.**, and \*\*Shock, E. L. (2007) Hydrothermal Geochemistry as the Source of Plume Gases on Enceladus, *XXXVIII Lunar and Planet. Sci.*, [CD-ROM], abstract 1251.
97. \*McAdam, A. C., **Zolotov, M. Yu.**, Mironenko, M. V., Leshin, L. A., and \*\*Sharp, T. G. (2006) Low pH Weathering of Mars Analog Lithologies: Thermodynamic Modeling, *Geochimica et Cosmochimica Acta*, Supplement, **70**, No. 18, p. 406.
96. **Zolotov, M. Yu.**, and \*\*Shock, E. L. (2006) Chemical Evolution of Europa's Ocean: Insights from Chondrites, *Europa Focus Group, Workshop 5*, Moffett Field, California, February 27-28, 2006, abstracts, 135-136.
95. **Zolotov, M. Yu.**, and \*\*Shock, E. L. (2006) Evolution of Chemical Energy Sources for Life on Europa, *Astrobiology*, **6**(1), p. 162.
94. \*\*Shock, E. L., **Zolotov, M.**, and \*\*Holloway, J. (2006) Heat Loss, Planetary Differentiation and the Emergence of Life, *Astrobiology*, **6**(1), p. 96.
93. \*McAdam, A. C., **Zolotov, M. Yu.**, Mironenko, M. V., Leshin, L. A., and \*\*Sharp, T. G. (2006) Aqueous Chemical Weathering of a Mars Analog Lithology: Kinetic Modeling for a Ferrar Dolerite Composition, *XXXVII Lunar and Planet. Sci.*, [CD-ROM], abstract 2363.
92. Kuzmin, R. O., \*\*Christensen, P. R., **Zolotov, M. Yu.**, and \*\*Anwar S. (2006), Mapping of Seasonal Bound Water Content Variations on the Martian Surface Based on the TES Data, *XXXVII Lunar and Planet. Sci.* [CD-ROM], abstract 1846.
91. Kuzmin, R. O., \*\*Christensen, P. R., \*\*Ruff, T. G., \*Knudson, A. T, **Zolotov, M. Yu.**, and Athena Science Team, (2006) Spatial and Temporal Variations of Bound Water Content in the Martian Soil Within the Gusev Crater: Preliminary Results of the TES and Mini-TES Data Analysis, *XXXVII Lunar and Planet. Sci.* [CD-ROM], abstract 1673.
90. Niles, P. B., **Zolotov, M. Yu.**, and Leshin, L. A. (2006) The Role of CO<sub>2</sub> in Aqueous Alteration of Ultra-Mafic Rocks and the Formation of Mg-, Fe-rich Aqueous Solutions on Early Mars, *XXXVII Lunar and Planet. Sci.* [CD-ROM], abstract 1440.
89. **Zolotov, M. Yu.**, \*Krieg, M. L., \*\*Shock, E. L., and McKinnon, W. B. (2006) Chemistry of a Primordial Ocean on Europa, *XXXVII Lunar and Planet. Sci.* [CD-ROM], abstract 1435.
88. **Zolotov, M. Yu.** (2006) Venus Atmosphere-Surface Chemical Interactions, *AGU Chapman Conference on Exploring Venus as a Terrestrial Planet*, Key Largo, FL, 13-17 February 2006, vol. of abstracts, 16.
87. **Zolotov, M. Yu.**, Owen T., Atreya S., Niemann H., and Shock, E. L. (2005) An Endogenic Origin of Titan's Methane, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract P43B-O4, Invited.
86. Owen, T., Atreya, S., Niemann, H., and **Zolotov M.** (2005) Titan: A Fiercely Frozen Echo of the Early Earth, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract U23A-08.
85. **Zolotov, M. Yu.** (2005) Water-Rock Reactions on Non-Planetary Bodies in the Early Solar System, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract P53A-07, Invited.

84. Kuzmin R. O., Christensen P. R., **Zolotov M. Yu.**, and Anwar S. (2005) Seasonal Variations of the Bound Water Content on the Martian Surface: Global Mapping of the 6.1  $\mu\text{m}$  Emissivity Band Based on TES Data. *Brown-Vernadsky Microsymposium on Comparative Planetology*. October 2005, Moscow. Vernadsky Institute.
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