

Qi Fu

Assistant Professor
Department of Earth & Atmospheric Sciences
312 Science & Research Building 1
University of Houston
Houston, TX 77204-5007

Office: Room 328B
Telephone: (713) 743-3660
Fax: (713) 743-4544
Email: qfu5@central.uh.edu

EDUCATION

2006 Ph.D., Geology, University of Minnesota, Twin Cities, MN
1997 M.S., Earth Sciences, Nanjing University, Nanjing, China
1994 B.S., Earth Sciences, Nanjing University, Nanjing, China

PROFESSIONAL EXPERIENCE

2013 – Present Assistant Professor, Dept. of Earth & Atmospheric Sciences, University of Houston, Houston, TX
2012 – 2013 Research Assistant Professor, Dept. of Earth & Atmospheric Sciences, University of Houston, Houston, TX
2011 – 2013 Research Scientist, NASA Johnson Space Center, Houston, TX
2008 – 2011 Postdoctoral Fellow, NASA Johnson Space Center & Lunar and Planetary Institute, Houston, TX
2006 – 2008 Postdoctoral Associate, Dept. of Geology and Geophysics, University of Minnesota, Twin Cities, MN

FUNDED PROJECTS

09/01/2014-08/31/2016 Q. Fu – P.I.
Experimental study of carbon and hydrogen isotope equilibria among CO₂ and hydrocarbons in sedimentary basins.
American Chemical Society Petroleum Research Fund (ACS PRF) - \$110,000

09/01/2014-05/31/2015 Q. Fu – P.I.
Oxidation kinetics of organic compounds and evolution of carbon and hydrogen isotopes under martian subsurface conditions: An experimental study.
UH New Faculty Research program - \$6,000

08/10/2010-04/24/2015 Q. Fu – P.I.
Experimental Investigations on Reaction Pathways and Isotope Signatures of Abiotic Organic Synthesis in Hydrothermal Systems.
NASA Astrobiology: Exobiology and Evolutionary Biology program, Grant NNX10AR18G and NNX13AH75G - \$298,677 (\$88,487.73 to UH)

PROFESSIONAL SERVICE

• Proposal Review

NSF Marine Geology and Geophysics (MGG) program, 2014, 2015

DoD Science, Mathematics And Research for Transformation (SMART) Scholarship for Service Program, 2015

• **Journal Review**

Geochemical Transactions

Geochimica et Cosmochimica Acta

Geology

Journal of Geochemical Exploration

Journal of Geophysical Research - Atmospheres

• **Conferences**

Science program committee member:

Lunar Planet. Sci. Conf. XLII. Houston, TX. March, 2011.

Session chair:

“Origin and fate of organic compounds in hydrothermal systems”, *Goldschmidt Conference 2015*. Prague, Czech. August, 2015.

“Hydrothermal systems and organosynthesis processes: Origin and evolution of life”, *Astrobiology Science Conference 2010*. Houston, TX. April, 2010.

Student awards committee member:

Volcanology, geochemistry, and petrology (VGP) section, American Geophysical Union (AGU), 2013, 2014, 2015.

Student presentation judge:

Outstanding student paper award (OSPA). *American Geophysical Union (AGU) Fall Meeting*, 2013, 2014.

Student poster competition. *Astrobiology Science Conference 2012*. Atlanta, GA. April, 2012.

Dwornik student presentation awards. *Lunar Planet. Sci. Conf. XXXX*. Houston, TX. March, 2009.

MENTORING EXPERIENCE

2014 – present Advisor: Xueze Chen (Ph.D.), Bingyi Zhao (Ph.D.), Meri McCulley (M.S.), Nikole Robertson (M.S.), Maisha Mujib (undergraduate), Chao Chang (visiting Ph.D.)

2012 Co-Advisor, Summer intern program, NASA Johnson Space Center, Houston, TX
2009, 2010 Co-Advisor, Summer intern program, Lunar and Planetary Institute, Houston, TX

PUBLICATIONS

Fu Q., Socki R. A., and Niles P. B. (2015) Evaluating reaction pathways of hydrothermal abiotic organic synthesis at elevated temperatures and pressures using carbon isotopes. *Geochimica et Cosmochimica Acta* 154, 1-17.

Qian Q., Parajuli B., **Fu Q.**, Yan K., Gossage J. L., Ho T. C. (2013) Assessment of acid deposition effects on water quality of the upper Rio Grande river section in Texas. *Journal of Water Resource and Protection* 5, 792-800.

Lu P., **Fu Q.**, Seyfried W. E. Jr., Hedges S. W., Soong Y., Jones K., and Zhu C. (2013) Coupled alkali feldspar dissolution and secondary mineral precipitation in batch systems: 2. New experiments with supercritical CO₂ and implications for carbon sequestration. *Applied Geochemistry* 30, 75-90.

Lu P., **Fu Q.**, Seyfried W. E. Jr., Hereford A., and Zhu C. (2011) Navajo Sandstone – brine – CO₂ interaction: implications for geological carbon sequestration. *Environmental Earth Sciences* 62, 101-118.

Seyfried W. E. Jr., Pester N., and **Fu Q.** (2010) Phase equilibria controls on the chemistry of vent fluids from hydrothermal systems on slow spreading ridges: Reactivity of plagioclase and olivine solid solutions and the pH-silica connection. In *Diversity of Hydrothermal Systems on Slow Spreading Ocean Ridges* (eds. P. Rona, C. Davey, J. Dymant, and B. Murton). Geophysical Monograph Series 188, pp.297-320. American Geophysical Union, Washington D.C.

Fu Q., Lu P., Konishi H., Dilmore R., Xu H., Seyfried W. E. Jr., and Zhu C. (2009) Coupled alkali-feldspar dissolution and secondary mineral precipitation in batch systems: 1. New experiments at 200°C and 300 bars. *Chemical Geology* 258, 125-135.

Fu Q., Foustoukos D. I., and Seyfried W. E. Jr. (2008) Mineral catalyzed organic synthesis in hydrothermal systems: An experimental study using time-of-flight secondary ion mass spectrometry. *Geophysical Research Letters* 35, L07612, doi:10.1029/2008GL033389.

Fu Q., Sherwood Lollar B., Horita J., Lacrampe-Couloume G. and Seyfried W. E. Jr. (2007) Abiotic formation of hydrocarbons under hydrothermal conditions: Constraints from chemical and isotope data. *Geochimica et Cosmochimica Acta* 71, 1982-1998.

Seyfried W. E. Jr., Foustoukos D. I., and **Fu Q.** (2007) Redox evolution and mass transfer during serpentinization: An experimental and theoretical study at 200°C, 500 bar with implications for ultramafic-hosted hydrothermal systems at Mid-Ocean Ridges. *Geochimica et Cosmochimica Acta* 71, 3872-3886.

Fu Q., Seyfried W. E. Jr., and Horita J. (2004) Hydrothermal carbon dioxide reduction with magnetite at 400°C and 500 bar. In *Proceedings of the 11th International Symposium on Water-Rock Interaction* (ed. R. B. Wanty and R. R. Seal II), pp. 1285-1288. London, Taylor & Francis Group.

Hu W., Zhou H., Gu L., Zhang W., Lu X., **Fu Q.**, Pan J., and Zhang H. (2000) New evidence of microbe origin for ferromanganese nodules from the East Pacific deep sea floor. *Science in China, Series D: Earth Sciences* 43 (2), 187-192.

Hu W., Jin Z., Qiu N., **Fu Q.**, Lu X., and Sun R. (1999) Boiling process of low temperature formation water in petroleum system, Qaidam Basin. *Chinese Science Bulletin* 44 (Suppl. 2), 77-78.

Lu X., Hu W., **Fu Q.**, Miao D., Zhou G., and Hong Z. (1999) Study of combination pattern of soluble organic matters and clay minerals in the immature source rocks in Dongying depression, China. *Chinese Journal of Geology (Scientia Geologica Sinica)* 34 (1), 69-77.

Lu X., Hu W., **Fu Q.**, Zhang W., Zhou G., Hong Z., and Chen Z. (1998) Study of salinity evolution of geofluids during syngensis and diagenesis using composition of carbonate minerals: An example of the immature source rocks of Shasi member in Dongying depression. *Acta Sedimentologica Sinica* 16 (1), 120-126.

Fu Q., Hu W., and Lu X. (1997) Effect of CO₂ on the solubility of CH₄ using the equation of state for the CH₄-bearing fluids. *Journal of Nanjing University (Natural Sciences)* 33, Geofluid Issue, 123-128.

Hu W., **Fu Q.**, Lu X., and Duan Z. (1996) Study of pressure and phase transition of gas (oil)-bearing fluids system. *Geological Journal of China Universities* 2(4), 458-465.

CONFERENCE PRESENTATIONS

Fu Q., Locke D. R., and Niles P. B. (2015) Experimental study of carboxylic acid oxidation under Martian conditions: Chemical and isotope characterization. *Goldschmidt conference 2015*.

Mujib M. Z. and **Fu Q.** (2015) Carbon isotopes of evolved CO₂ during acetic acid oxidation by different oxidizing agents. *46th Lunar Planet. Sci. Conf.*, Abstract #2954.

Fu Q., Haynie K. L., Gong C., Darnell M., and Khan S. (2015) Tar balls on Elmer's Island, Louisiana: Identifying technology and geochemical characterization. *2015 Gulf of Mexico Oil Spill and Ecosystem Science Conference, Houston, Texas*.

Fu Q., Darnell M., and Bissada K. K. (2014) Maturation of Green River shale kerogen with hydrous pyrolysis: Characterization of geochemical biomarkers and carbon isotopes. *AGU Fall Meeting 2014*, Abstract #V51D-4810.

Socki R., Pernia D., Bissada K. K., Curiale J. A., Evans M., **Fu Q.**, and Niles P. (2014) Hydrogen (H) isotope composition of Type II kerogen extracted by Pyrolysis-GC-MS-IRMS: Terrestrial shale deposits as Martian analogs. *AGU Fall Meeting 2014*, Abstract #V51D-4811.

Fu Q., Darnell M., Szymczyk E., and Bissada K. K. (2014) Chemical speciation and carbon isotope systematics during kerogen maturation: An experimental study. *AAPG annual convention 2014, Houston, Texas*.

Socki R. A., Niles P. B., Sun T., **Fu Q.**, Romanek C., and Gibson E. K. (2014) Martian cryogenic carbonate formation: Stable isotope variations observed in laboratory studies. *Lunar Planet. Sci. XXXXV*, Abstract #2757.

Fu Q., Socki R. A., Niles P. B., Romanek C., Datta S., Darnell M., and Bissada K. K. (2013) The origin of carbon-bearing volatiles in Surprise Valley Hot Springs in the Great Basin: Carbon isotope and water chemistry characterizations. *AGU Fall Meeting 2013*, Abstract #B13E-0561.

Socki R., Niles P. B., Sun T., **Fu Q.**, Romanek C. S., and Gibson E. K. (2013) Carbonate mineral formation on Mars: Clues from stable isotope variations seen in cryogenic laboratory studies of carbonate salts. *AGU Fall Meeting 2013*, Abstract #V21A-2702.

Socki R., Pernia D., Evans M., **Fu Q.**, Bissada K., Curiale J., and Niles P. (2013) Compound specific hydrogen isotope composition of Type II and III kerogen extracted by Pyrolysis-GC-MS-IRMS. *AAPG annual convention 2013*.

Fu Q., Socki R., and Niles P. B. (2012) Evaluating reaction pathways of hydrothermal abiotic organic synthesis at elevated conditions using carbon isotopes. *The Organic Geochemistry Gordon Research Conference*.

- Fu Q.**, Niles P. B., and Socki R. (2012) Carbon isotopes of evolved CO₂ during oxidation of carboxylic acids by hydrogen peroxide. *Ab. Sci. Con 2012*, Abstract #2045.
- Socki R. A., **Fu Q.**, Niles P. B., and Gibson E. K. (2012) C and H isotope measurements of alcohols and organic acids by online Pyroprobe-GC-IRMS. *Ab. Sci. Con 2012*, Abstract #4411.
- Fu Q.**, Socki R. A., Niles P. B., Romanek C., Datta S., and Darnell M. (2012) The origin of carbon-bearing volatiles in a continental hydrothermal system in the Great Basin: Water chemistry and isotope characterizations. *Lunar Planet. Sci. XXXXIII*, Abstract #2481.
- Socki R. A., **Fu Q.**, Niles P. B., and Gibson E. K. (2012) Hydrogen isotope measurements of organic acids and alcohols by Pyrolysis-GC-MS-TC-IRMS: Application to analysis of experimentally derived hydrothermal mineral-catalyzed organic products. *Lunar Planet. Sci. XXXXIII*, Abstract #2483.
- Socki R., **Fu Q.**, and Niles P. B. (2011) Hydrogen isotope measurements of organic acids and alcohols by Pyrolysis-GC-MS-TC-IRMS. *AGU Fall Meeting 2011*, Abstract #V31B-2524.
- Fu Q.**, Socki R., and Niles P. B. (2011) Carbon isotope systematics in mineral-catalyzed hydrothermal organic synthesis processes at high temperatures and pressures. *Lunar Planet. Sci. XXXXII*, Abstract #1057.
- Socki R. A., **Fu Q.**, and Niles P. B. (2011) Carbon isotope measurements of experimentally-derived hydrothermal mineral-catalyzed organic products by Pyrolysis-Isotope ratio mass spectrometry. *Lunar Planet. Sci. XXXXII*, Abstract #2311.
- Fu Q.**, Socki R., and Niles P. B. (2010) Experimental study of abiotic organic synthesis at high temperature and pressure conditions: Carbon isotope and mineral surface characterizations. *AGU Fall Meeting 2010*, Abstract #V51B-2191.
- Socki R., **Fu Q.**, and Niles P. B. (2010) Carbon isotope characterization of organic intermediaries in hydrothermal hydrocarbon synthesis by Pyrolysis-GC-MS-C-IRMS. *AGU Fall Meeting 2010*, Abstract #V51B-2189.
- Fu Q.**, Socki R., and Niles P. B. (2010) Carbon isotopes of alkanes in hydrothermal abiotic organic synthesis processes at high temperatures and pressures: An experimental study. *Ab. Sci. Con 2010*, Abstract #5572.
- Fu Q.** and Niles P. B. (2010) Kinetic isotope fractionation processes during experimental formation of Ca- and Mg-rich carbonates: Implications for ALH84001. *Lunar Planet. Sci. XXXXI*, Abstract # 2474.
- Socki R., Niles P. B., **Fu Q.**, and Gibson E. K., Jr. (2010) Cryogenic carbonate formation on Mars: Clues from stable isotope variations seen in experimental studies. *Lunar Planet. Sci. XXXXI*, Abstract # 2526.
- Zhu C., Lu P., **Fu Q.**, and Seyfried W. E. Jr., (2009) New experimental data and modeling results of coupled alkali feldspar dissolution and secondary mineral precipitation. *Geochimica et Cosmochimica Acta* **73** (13), A1530-A1530. Suppl. 1, JUNE 2009.
- Fu Q.** and Seyfried W. E. Jr. (2009) Experimental study of abiotic synthesis processes in a hydrothermal flow system: Implications for organic matter formation in extraterrestrial environments. *Lunar Planet. Sci. XXXX*, Abstract #2504.

Seyfried W. E. Jr., Ding K., Pester N., and **Fu Q.** (2008) Geochemical controls on the composition of hydrothermal vent fluids at EPR 9°N: pH and redox constraints from *in situ* chemical sensor deployments and experimental and theoretical model results. *Eos Trans. AGU*, 89 (47), Fall Meet. Suppl., Abstract V44B-04.

Lu P., **Fu Q.**, Seyfried W. E. Jr., and Zhu C. (2008) Navajo sandstone-brine-CO₂ interactions: Implications for geological carbon sequestration. In *2008 joint meeting of GSA, SSSA, ASA, CSSA, GCAGS with GCSSEPM*, Houston, Texas.

Lu P., **Fu Q.**, Seyfried W. E. Jr., Strazisar B. R., Hedges S. W., Zheng Z., and Zhu C. (2007) Experimental determination of reaction rates and modeling of the long-term fate of CO₂ in deep geological formations. In *AAPG Eastern Section Meeting*, Lexington, Kentucky.

Lu P., **Fu Q.**, Seyfried W. E. Jr., Strazisar B. R., Hedges S. W., Zheng Z., and Zhu C. (2007) Experimental determination of reaction rates and modeling of the long-term fate of CO₂ in deep geological formations. In *AAPG Annual Meeting*, Long Beach, California.

Seyfried W. E. Jr., Ding K., **Fu Q.**, and Foustoukos D. I. (2006) Chemistry of seafloor hydrothermal vent fluids at mid-ocean ridges: Perspectives on organic synthesis from laboratory and field investigations. In *The 58th Southeastern regional meeting of the American Chemical Society*, Paper #36229. Augusta, Georgia.

Fu Q., Sherwood Lollar B., Horita J., Lacrampe-Couloume G., and Seyfried W. E. Jr. (2005) Hydrogen and carbon isotope compositions of hydrocarbons in hydrothermal carbon reduction processes. *Geochimica et Cosmochimica Acta* 69 (10), A558-A558. Suppl. S, MAY 2005.

Sherwood Lollar B., Telling J., Lacrampe-Couloume G., **Fu Q.**, Seyfried W. E. Jr., Horita J., and McCollom T. M. (2005) Carbon and hydrogen isotope measurements in abiogenic hydrocarbon synthesis. *Geochimica et Cosmochimica Acta* 69 (10), A557-A557. Suppl. S, MAY 2005.

Fu Q., Foustoukos D. I., and Seyfried W. E. Jr. (2005) Formation of intermediate carbon phases in hydrothermal abiotic organic synthesis. *Eos Trans. AGU*, 86 (52), Fall Meet. Suppl., Abstract B31B-0989.

Seyfried W. E. Jr., **Fu Q.**, and Foustoukos D. I. (2005) The Rainbow hydrothermal system: Experimental and theoretical controls on vent fluid chemistry and subseafloor alteration processes. *Eos Trans. AGU*, 86 (52), Fall Meet. Suppl., Abstract OS21C-07.

Seyfried W. E. Jr., Foustoukos D. I., and **Fu Q.** (2005) Temperature effects on phase relations in ultramafic-hosted hydrothermal systems. *Eos Trans. AGU*, 86 (52), Fall Meet. Suppl., Abstract V43C-04.

Foustoukos D. I., **Fu Q.**, and Seyfried W. E. Jr. (2004) Abiotic Synthesis of Methane Under Hydrothermal Conditions: the Effect of pH in Heterogeneous Catalysis. *Eos Trans. AGU*, 85 (47), Fall Meet. Suppl., Abstract B13A-0212.

Seyfried W. E. Jr., **Fu Q.**, Foustoukos D. I., and Allen D. E. (2004) Processes and Rates of Mass Transfer in Ultramafic-Hosted Hydrothermal Systems: An Experimental Study with Implications for Dissolved Inorganic and Organic Components in High-Temperature Vent Fluids. *Eos Trans. AGU*, 85 (47), Fall Meet. Suppl., Abstract V23C-02.

Fu Q. and Seyfried W. E. Jr. (2003) Hydrothermal Reduction of Carbon Dioxide at 250°C and 500bar. *Eos Trans. AGU*, 84 (46), Fall Meet. Suppl., Abstract OS31C-0216.

Fu Q., Horita J., and Seyfried W. E. Jr. (2002) Isotopic fractionation in magnetite-catalyzed hydrothermal carbon dioxide reduction processes. *Eos Trans. AGU*, 83 (47), Fall Meet. Suppl., Abstract P71C-0473.

Fu Q. and Seyfried W. E. Jr. (2001) Hydrothermal reduction of carbon dioxide using magnetite. In *Eleventh Annual V. M. Goldschmidt Conference*, Abstract #3581. LPI Contribution No. 1088, Lunar and Planetary Institute, Houston.

Foustoukos D.I., Allen D.E., **Fu Q.**, and Seyfried W.E. Jr. (2001) Experimental study of CO_{2(aq)}/CO_(aq) redox equilibria at elevated temperatures and pressures: The effect of pH on reaction relations. In *Eleventh Annual V. M. Goldschmidt Conference*, Abstract #3855. LPI Contribution No. 1088, Lunar and Planetary Institute, Houston.

INVITED LECTURES

Experimental study of generation and transformation of organic compounds in hydrothermal systems. Shandong University of Science and Technology, Qingdao, China. July 2, 2014.

Understanding hydrocarbon formation and interaction with laboratory experiments. Nanjing University, Nanjing, China. June 18, 2014.

Experimental investigations of hydrocarbon formation and transformation in sedimentary basins. Petroleum Exploration and Production Research Institute, SINOPEC, Beijing, China. June 11, 2014.

Experimental investigations on abiotic formation of hydrocarbons under hydrothermal conditions. Lunar and Planetary Institute, Houston, TX. September 5, 2008.

WORKSHOPS

TOUGH Training Course, Lawrence Berkeley National Laboratory (2006)

The Geochemist's Workbench (GWB) Training Course, RockWare Inc. (2002)

MODFLOW Training Course, Missimer International Inc. (1998)

AWARDS and HONORS

Visiting Professor, Shandong University of Science and Technology, Qingdao, China (2014-2017)

NASA Early Career Fellow (2010)

SCHOLARSHIPS

Dennis Graduate Fellowship, University of Minnesota (2003-2004)

Maximillion Lando Scholarship, University of Minnesota (2004)

Gibson Scholarship, University of Minnesota (2002, 2003)

Guang Hua Graduate Fellowship, Nanjing University (1995)

Ying Song Scholarship, Nanjing University (1993)

Nanjing University Scholarship, Nanjing University (1992-1994)

PROFESSIONAL AFFILIATIONS

American Association of Petroleum Geologists (AAPG)

American Geophysical Union (AGU)
Geochemical Society (GS)
Geological Society of America (GSA)
NASA Astrobiology Institute (NAI)