

CV- Huiming Bao

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PROFESSIONAL PREPARATION

Peking University, P. R China	Geology	B. Sc.	1982-1986
Nanjing Institute of Geology and Paleontology, Chinese Academy of Sciences	Geology & Palaeontology	M.Sc.	1986-1989
Princeton University	Geosciences	Ph. D	1993-1998
University of California San Diego	Atmospheric Chemistry	Postdoc	1998-2001

APPOINTMENTS

2012- present Charles L. Jones Professor in Geology and Geophysics, Louisiana State University
2007-2012 Associate professor in Geology and Geophysics, Louisiana State University
2001-2007 Assistant professor in Geology and Geophysics, Louisiana State University
1998-2001: Postdoctoral Research Chemist, University of California San Diego
1996-1997: Research Scientist, University of California, Santa Cruz (in absentia from Princeton University)
1993-1998: Assistant in Instruction/Research, Princeton University
1989-1993: Assistant Researcher, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences

ADDITIONAL PROFESSIONAL EXPERIENCES

2016-2019: Visiting Professor, Peking University
2015 (Sept to Nov): Visiting Professor, Zhejiang University;
2014 (May to Aug.): Guest Professor, Tokyo Institute of Technology;
2010 (June to July): Gledden Visiting Senior Fellow, University of Western Australia;
2009-2013, 2013-2016: 2018- Visiting Scholar, GYIG;
2007-2011 Visiting Scholar, Nanjing Institute of Geology & Palaeontology, Chinese Academy of Sciences

COURSES TAUGHT

Physical Geology and *The History of Earth* for undergraduate students;
Stable Isotope Geochemistry and *Carbonate Geochemistry and Petrology* at the graduate levels;
Advanced seminars: *Atmospheric signatures in rock records*;
Multi-dimensional stable isotope fractionation;
Secular evolution of Earth's redox condition;
Chemical and Stable Isotope Kinetics.

RESEARCH INTERESTS

Multiple stable isotopic systems, Earth systems history (on the interaction between the biosphere, hydrosphere, and atmosphere), planetary sciences, and atmospheric & environmental chemistry

HONORS

2012: AAAS Fellow (American Association for the Advancement of Sciences)

2011: U.S. Environmental Protection Agency's Scientific and Technological Achievement Award

PUBLICATIONS BY DATE (*Bao's students or postdocs; PUBS BY SUBJECT is in Appendix)

2019

Xiaobin Cao*, **Huiming Bao**, Caihong Gao, Yun Liu, Fang Huang, Yongbo Peng, Yining Zhang, 2019, Triple oxygen isotope constraints on the origin of ocean island basalts. *Acta Geochimica*, 38(3): 327-334.

Crockford, P.W., Kunzmann M., Bekker, A., Hayles J. **Bao, H.**, and 14 others, 2019, Claypool continued: Extending the isotopic record of sedimentary sulfate, *Chemical Geology*, 513: 200-225.

Cao*, Xiaobin, **Huiming Bao**, Yongbo Peng, A kinetic model for isotopologue signatures of methane generated by biotic and abiotic CO₂ methanation, *Geochimica et Cosmochimica Acta*, 249: 59-75.

2018

He*, Yuyang and **Huiming Bao**, 2018, Predicting High-Dimensional Isotope Relationships from Diagnostic Fractionation Factors in Systems with Diffusional Mass Transfer, *ACS Earth Space Chem*. DOI: 10.1021/acsearthspacechem.8b00149.

Crockford, P, Justin Hayles*, **Huiming Bao**, Noah J. Planavsky, Andrey Bekker, Philip W. Fralick, Galen P. Halverson, Thi Hao Bui, Yongbo Peng, and Boswell A. Wing, 2018, Triple oxygen isotope evidence for limited mid-Proterozoic primary production. *Nature*, July 26, 2018.

Hayles*, Justin, Cao, Xiaobin*, **Bao, Huiming**, 2018, Theoretical Calibration of the Triple Oxygen Isotope Thermometer, *Geochimica et Cosmochimica Acta*, 235: 237-245.

Killingsworth*, Bryan, **Bao, Huiming**, and Kohl, Issaku*, 2018, Assessing Pyrite-Derived Sulfate in the Mississippi River with Four Years of Sulfur and Triple-Oxygen Isotope Data, *Environmental Sciences & Technology*. DOI: 10.1021/acs.est.7b05792, 52: 6126-6136.

Blätter C. L., M. W. Claire, A. R. Prave, K. Kirsimäe, J.A. Higgins, P. V. Medvedev, A. E. Romashkin, D. V. Rychanchik, A. L. Zerkle, K. Paiste, T. Kreitsmann, I. L. Millar, J. A. Hayles*, **HM. Bao**, A. V. Turchyn, M. R. Warke, A. Lepland, 2018, Two-billion-year-old evaporites capture Earth's great oxidation, *Science*, 10.1126/science.aar2687.

X Lang, B Shen, Y Peng*, S Xiao, C Zhou, **H Bao**, AJ Kaufman, K Huang, ... 2018, Transient marine euxinia at the end of the terminal Cryogenian glaciation. *Nature communications*, 9 (1), 3019.

Sun, Tao*, **Bao, Huiming**, Reich, Martin, Hemming Sidney, 2018, More than Ten Million Years of Hyper-aridity recorded in the Atacama Gravels. *Geochimica et Cosmochimica Acta*, 227:123-132.

- Reich, M., **Bao, H**, 2018, Nitrate Deposits of the Atacama Desert: A Marker of Long-Term Hyperaridity, *Elements*, 14(4): 251-256.
- He*, Yuyang, Cao* XB, Wang JW, **Bao HM.**, 2018, Identifying apparent local stable isotope equilibrium in a complex non-equilibrium system. *Rapid Commun. Mass Spectrom.* 32:306-310. <https://doi.org/10.1002/rcm.8040>
- Luo*, Haiyang, **Huiming Bao**, Yuhong Yang, Yun Liu, 2018, Theoretical calculation of equilibrium Mg isotope fractionation between silicate melt and its vapor, *Acta Geochimica*, 37 (5): 655-662.
- Li, Shijie, Yin, QZ, **Bao, HM**, Sanborn, ME and 8 others, 2018, Evidence for a Multilayered Internal Structure of the Chondritic Acapulcoite-Lodranite Parent Asteroid. *Geochimica et Cosmochimica Acta*, 242: 82-101.
- Gong*, S.G., Peng, Y.B.*, **Bao, H.M.**, Feng, D., Cao, X.B.*, Crockford, P.W., and Chen, D.F., 2018, Triple sulfur isotope relationships during sulfate-driven anaerobic oxidation of methane, *Earth and Planetary Science Letters*, 504: 13-20.

2017

- Benjamin L. Byerly, Keena Kareem, **Huiming Bao**, Gary R. Byerly, 2017, Early Earth mantle heterogeneity revealed by light oxygen isotopes of Archaean komatiites. *Nature Geosciences*, v. 10, 871-876.
- Cao*, Xiaobin, and **Bao, Huiming**, 2017, Redefining the utility of the three-isotope method: *Geochimica et Cosmochimica Acta*, v. 212, p. 16-32, doi: 10.1016/j.gca.2017.05.028.
- Hayles*, J.A., Cao*, Xiaobin, **Bao, Huiming**, 2017, The statistical mechanical basis of the triple isotope fractionation relationship, *Geochemical Perspective Letter*. 3:1-11, doi: 10.7185/geochemlet.1701.

2016

- Niu, Lili; Xu, Chao; Zhu, Siyu; **Bao, Huiming** and 6 others, 2016, Enantiomer signature and carbon isotope evidence for the migration and transformation of DDTs in arable soils across China, *Scientific Reports*, 6, 38475; doi: 10.1038/srep38475.
- Feng, D., Peng*, YB, **Bao, HM**, Peckmann, J., Roberts, H.H., and Chen, D.F. 2016, A carbonate-based proxy for sulfate-driven anaerobic oxidation of methane, *Geology*. Data Repository item 2016336 | doi:10.1130/G38233.1
- Ian J. Fairchild, Edward J. Fleming, **Huiming Bao**, Douglas I. Benn and 9 others, 2016, Continental carbonate facies of a Neoproterozoic panglaciatio, north-east Svalbard. *Sedimentology*. V. 63, p.1-56. DOI: 10.1111/sed.12252.
- Bao, Huiming**, Cao*, Xiaobin, and Hayles*, A. J., 2016, Triple Oxygen Isotopes: Principle and Applications, *Annual Review of Earth and Planetary Sciences*, 44:463–92; DOI: 10.1146/annurev-earth-060115-012340.

2015

- Zhu, Dan, **Bao, Huiming**, Liu, Yun, 2015, Non-traditional stable isotope behaviors in immiscible silica-melts in a mafic magma chamber, *Scientific Reports*. 5:17561 | DOI: 10.1038/srep17561.
- Bao, Huiming**, Cao, Xiaobin*, and Hayles, A. Justin*, 2015, The confines of triple oxygen isotope exponents in elemental and complex mass-dependent processes. *Geochimica et Cosmochimica Acta*. 170:39–50; DOI: 10.1016/j.gca.2015.07.038.

Douglas I. Benn, Yannick Donnadieu, **Huiming Bao**, Christian Dumas, Edward J. Fleming, Michael J. Hambrey, Guillaume Le Hir, Emily A. McMillan, Michael S. Petronis, Gilles Ramstein, Carl T.E. Stevenson, Peter M. Wynn, Ian J. Fairchild, Orbitally Forced Climatic Fluctuations in Snowball Earth. *Nature Geosciences*, v. 8(9), p. 704-+; PUBLISHED ONLINE: 24 AUGUST 2015 | DOI: 10.1038/NCEO2502.

Hayles, A. Justin*, **Bao, Huiming**, The reduction and oxidation of ceria: A natural abundance triple oxygen isotope perspective. *Geochimica et Cosmochimica Acta*. 159 (2015), p. 220-230; DOI: 10.1016/j.gca.2015.03.030.

Sun, Tao*, Richard A. Socki, David L. Bish, Ralph P. Harvey, **Huiming Bao**, Paul Niles, Ricardo Cavicchioli, Eric Tonui, Lost cold deserts in the Antarctica interior inferred from unusual sulfate deposits and multiple isotope signatures. *Nature Communications*, June 29 (2015), DOI: 10.1038/ncomms8579.

Killingsworth, A. Bryan*, **Bao, Huiming**, 2015, Significant human impact on the flux and $\delta^{34}\text{S}$ of sulfate from the largest river in North America. *Environmental Sciences & Technology*, Vol.49 (8) p. 4851-4860.

Li, P., Yan, R., Yu, S., Wang, S., Liu, W., **Bao, Huiming**, 2015, Reinstate regional transport of PM_{2.5} as a major cause of severe haze in Beijing. *PNAS*. 10.1073/pnas.1502596112. May 26, 2015, vol. 112(21), E2739–E2740.

Bao, Huiming, 2015, Sulfate: A time capsule for Earth's O₂, O₃, and H₂O, *Chemical Geology*, 395, 108-118; DOI: 10.1016/j.chemgeo.2014.11.025 (*Invited Review*).

2014

Peng, Yongbo*, **Bao, Huiming**, and 9 others, 2014, Widespread contamination of carbonate-associated sulfate by present-day secondary atmospheric sulfate: Evidence from triple oxygen isotopes, *Geology*, doi:10.1130/G35852.1.

2013

Cao, Xiaobin* and **Bao, Huiming**, 2013, Dynamic model constraints on oxygen-17 depletion in atmospheric O₂ after a snowball Earth. *PNAS*, v. 110 (36), 14546-14550; www.pnas.org/cgi/doi/10.1073/pnas.1302972110.

Killingsworth, B. A*., Hayles, J*., Zhou, C. M., and **Bao, HM.**, 2013, Sedimentary constraints on the duration of the Marinoan Oxygen-17 Depletion (MOSD) event: *PNAS*, v. 110, no. 44, p. 17686-17690.

Peng, Yongbo*, **Bao, Huiming**, Zhou, Chuanming, Yuan, Xunlai, and Luo, Taiyi, 2013, Oxygen isotope composition of meltwater from a Neoproterozoic glaciation in South China. *Geology*, 41 (3), 367-370.

Li, Xiaoqian*; **Bao, Huiming**; Gan, Yiqun; Zhou, Aiguo; Liu, Yunde, 2013, Multiple oxygen and sulfur isotope compositions of secondary atmospheric sulfate in a mega-city in central China. *Atmospheric Environment*, 81(12), 591-599.

2012:

Kohl, I. E. *, Asatryan R., **Bao, HM**, 2012, No oxygen isotope exchange between water and APS–sulfate at surface temperature: Evidence from quantum chemical modeling and triple-oxygen isotope experiments. *Geochimica et Cosmochimica Acta*, 95, 106-118.

Bao, Huiming, Chen, Zhong-Qiang, Zhou, Chuanming, 2012, An ^{17}O record of late Neoproterozoic glaciation in the Kimberley region, Western Australia. *Precambrian Research*, v. 216-219, p.152-161. 10.1016/j.precamres.2012.06.019.

Qin, Y., Li, Y., **Bao, HM.**, Liu, F., et al., 2012, Massive atmospheric nitrate accumulation in a continental interior desert, northwestern China. *Geology*, v. 40 (7), p. 623-626.

2011:

Peng, Yongbo*, **Bao, Huiming**, Zhou, Chuanming, and Yuan, Xunlai, 2011, ^{17}O -depleted barite from two Marinoan cap dolostone sections, South China, *Earth and Planetary Science Letters*, 305, 21-31.

Kohl, I. E.* and **Bao, Huiming**, 2011, Triple-Oxygen-Isotope Determination of Molecular Oxygen Incorporation in Sulfate Produced during Abiotic Pyrite Oxidation (pH = 2-11), *Geochimica et Cosmochimica Acta*, 75, 1785-1798.

Sun, Tao* and **Bao, Huiming**, 2011, Thermal-Gradient Induced Non-Mass-Dependent Isotope Fractionation. *Rapid Communications in Mass Spectrometry*, 25, 765-773.

Bing Shen, Shuhai Xiao, **Huiming Bao**, Alan J. Kaufman, Chuanming Zhou, and Xunlai Yuan, 2011, Carbon, sulfur, and oxygen isotope evidence for a strong depth gradient and oceanic oxidation after the Ediacaran Hankschough glaciation, *Geochimica et Cosmochimica Acta*, 75, 1357-1373.

Sun, Tao* and **Bao, Huiming**, 2011, Non-mass-dependent ^{17}O anomalies generated by a superimposed thermal gradient on a rarefied O_2 gas in a closed system. *Rapid Communications in Mass Spectrometry*, 25, 20-24; DOI: 10.1002/rcm.4825.

Li, S.J., Wang, S.J., **Bao, HM.**, Miao, B.K., Liu, S., Coulson, I.M., Li, X.Y., Li, Y., 2011. The Antarctic achondrite, Grove Mountains 021663: An olivine-rich winonaite. *Meteoritics & Planetary Science* 46, 1329-1344.

2010:

Bao, Huiming, Yu, Shaocai, and Tong, Daniel Q., 2010, Massive volcanic SO_2 oxidation and sulphate aerosol deposition in Cenozoic North America. *Nature*, doi:10.1038/nature09100

Zhou, Chuanming, **Bao, Huiming**, Peng, Yongbo* and Yuan, Xunlai, 2010, Timing the deposition of ^{17}O -depleted barite at the aftermath of Nantuo glacial meltdown in South China. *Geology*, 38 (10), 903-906.

2009

Peng, Yongbo*, **Bao, Huiming**, and Yuan, X-L, 2009, New morphological observations for Paleoproterozoic acritarchs from the Chuanlinggou Formation, North China, *Precambrian Research*, 168, 223-232.

Bao, Huiming, Ian J. Fairchild, Peter M. Wynn, and Christoph Spötl, 2009, Stretching the Envelope of Past Surface Environments: Neoproterozoic Glacial Lakes from Svalbard, *Science*, 323, 119-122; DOI: 10.1126/science.1165373.

2008

Bao, Huiming, Jim Lyons, and Chuanming Zhou, 2008, Triple oxygen isotope evidence for elevated CO_2 levels after a Neoproterozoic glaciation, *Nature*, 453 (7194), 504-506; DOI: 10.1038/nature06959.

- Bao, Huiming**, Sun, T.*, Kohl, I.*, and Peng, Y.-P.*, 2008, Comments on “Early Archaean microorganisms preferred elemental sulfur, not sulfate”, *Science*, v. 319 (5868), p. 1336.
- Bao, Huiming**, Jaime D. Barnes, Zach D. Sharp, and David R. Marchant, 2008, Two chloride end-members in soils of the McMurdo Dry Valleys, Antarctica. *Journal of Geophysical Research, D: Atmospheres*, 113, D03301, doi:10.1029/2007JD008703.
- Farquhar, J., Canfield, D. E., Masterson, A., **Bao, HM**, and Johnston, D., 2008, Sulfur and oxygen isotope study of sulfate reduction in experiments with natural populations from Fællestrand, Denmark, *Geochimica et Cosmochimica Acta*, 72, 2805-2821.
- Bing Shen, Shuhai Xiao, Alan J. Kaufman, **Huiming Bao**, Chuanming Zhou, Haifeng Wang, Stratification and mixing of a post-glacial Neoproterozoic ocean: Evidence from carbon and sulfur isotopes in a cap dolostone from northwest China, 2008, *Earth and Planetary Science Letters*, 265 (102), 209-228.
- Socki, R. A., Harvey, R. P. , Bish, D. L., Tonui, E., **Bao, Huiming**, 2008, Stable isotope systematics of cryogenic evaporite deposits from Lowis Cliff ice tongue, Antarctica: A Mars analog, *Lunar and Planetary Science Conference* (NASA, Houston, 2008), Vol. XXXIX, pp. 1964.

2007

- Bao, Huiming**, Rumble III, D., Lowe, D. R., 2007, The five stable isotope compositions of the Fig Tree barites: Implications on sulfur cycle in an early Archean ocean. *Geochimica et Cosmochimica Acta*, doi: 10.1016/j.gca.2007.05.032.
- Schiffbauer, J. D., Yin, L.-M., Bondnar, R. J. Kaufman, A. J., Meng, F.W., Hu, J., Shen, B., Yuan, X.-L., **Bao, HM**, and Xiao, S. H., 2007, Ultrastructural and geochemical characterization of Archean–Paleoproterozoic graphite particles: Implications for recognizing traces of life in highly metamorphosed rocks. *Astrobiology*, 7(4), 684-704, DOI: 10.1089/ast.2006.0098.

2006

- Bao, Huiming**, and D. R. Marchant (2006), Quantifying sulfate components and their variations in soils of the McMurdo Dry Valleys, Antarctica, *Journal of Geophysical Research, D: Atmosphere*, 111, D16301, doi:10.1029/2005JD006669.
- Howell, K. J.* and **Bao, Huiming**, 2006, Caliche as a geological repository of atmospheric sulfate, *Geophysical Research Letters*, 33, L13816, doi: 10.1029/2006GL026518.
- Jenkins, K. A.* and **Bao, Huiming**, 2006, Multiple oxygen and sulfur isotope characterization of total atmospheric sulfate deposition in Baton Rouge, Louisiana, USA, *Atmospheric Environment*, 40, 4528-4537.
- Bao, Huiming**, 2006, Purifying synthetic barite for oxygen isotope measurement by dissolution and reprecipitation in a chelating solution. *Analytical Chemistry*, 78(1): 304-309.

2005

- Airieu, S.A., Farquhar, J., Thiemens, M.H., Leshin, L.A., **Bao, HM**, and Young, E., 2005, Planetesimal sulfate and aqueous alteration in CM and CI carbonaceous chondrites: *Geochim. Cosmochim. Acta*, v. 69, p. 4166-4171.
- Loope, D. B., Mason, J. A., **Bao, HM**, et al., 2005, Deformation structures and an alteration zone linked to deposition of volcanogenic sulfate in an ancient playa (Oligocene of Nebraska, USA). *Sedimentology*, 52, 123-139.

Bao, Huiming, 2005, Sulfate in modern playa settings and in ash beds in hyperarid deserts: Implication on the origin of ^{17}O -anomalous sulfate in an Oligocene ash bed. *Chemical Geology*, 214 (1-2), 127-134.

2004

Bao, Huiming and Gu, Baohua, 2004, Natural perchlorate has a unique oxygen isotope signature. *Environmental Science and Technology*, 38(19): 5073-5077.; [10.1021/es049516z](https://doi.org/10.1021/es049516z)

Bao, Huiming, Jenkins, K.A.*, Khachatryan, M. and Chong-Díaz, G., 2004. Different sulfate sources and their post-depositional migration in Atacama soils. *Earth & Planetary Science Letters*, 224 (3-4), 577-587.

Shuhai Xiao, **Huiming Bao**, Haifeng Wang, Alan J. Kaufman, Chuanming Zhou, Guoxiang Li, Xunlai Yuan, and Hongfei Ling, 2004, The Neoproterozoic Quruqtagh Group in eastern Chinese Tianshan: Evidence for a post-Marinoan glaciation. *Precambrian Research*, 130 (1-4), 1-26.

2003

Bao, Huiming, and Reheis, M.C., 2003. Multiple oxygen and sulfur isotopic analyses on water-soluble sulfate in bulk atmospheric deposition from the southwestern United States. *Journal of Geophysical Research, D: Atmosphere*, 108(D14): 4430; [10.1029/2002JD003022](https://doi.org/10.1029/2002JD003022).

Bao, Huiming, Thiemens, M.H., Loope, D.B. and Yuan, X.-L., 2003. Sulfate oxygen-17 anomaly in an Oligocene ash bed in mid-North America: Was it the dry fogs? *Geophysical Research Letters*, 30(16): 1843; [10.1029/2003GL016869](https://doi.org/10.1029/2003GL016869).

2002 (*Building Oxy-Anion Stable Isotope Consortium at LSU*)

2001

Bao, Huiming, Thiemens, M. H., and Heine, K., 2001, Oxygen-17 excesses of the central Namib gypcretes: Spatial distribution. *Earth & Planetary Science Letters* 192. 125-135.

Farquhar, J., **Bao, Huiming** & Thiemens, M. H. et al., 2001, Questions regarding Precambrian sulfur isotope fractionation – Response. *Science*, 292 (5524), U6-U7.

Thiemens, M. H., Savarino, J., Farquhar, J., **Bao, Huiming**, 2001, Mass-independent isotopic compositions in terrestrial and extraterrestrial solids and their Applications. *Accounts of Chemical Research*, 34(8), 645-652.

Bao, Huiming, Greg Michalski, and Mark H. Thiemens, 2001, Sulfate oxygen-17 anomalies in desert varnishes. *Geochim. Cosmochim. Acta* 65 (13), 2029-2036.

Zhou, C., Yan, K., Hu, J., Meng, F., Chen, Z., Xue, Y., Cao, R., Yin, L., Wang, J., Wang, J., Xiao, S., **Bao, HM.**, and Yuan, X., 2001, The Neoproterozoic tillites at Lantian, Xiuning County, Anhui Province [China], *Journal of Stratigraphy [in Chinese with English Abstract]*, v. 25, p. 247-252, 258.

2000

Bao, Huiming, Douglas A. Campbell, James G. Bockheim, Mark H. Thiemens, 2000, Origin of sulfate in Antarctic Dry Valley soils as deduced from anomalous ^{17}O compositions. *Nature* 407, 499-502.

- Bao, Huiming**, Thiemens, M. H., 2000, Generation of O₂ from BaSO₄ using a CO₂-laser fluorination system for simultaneous δ¹⁸O and δ¹⁷O analysis. *Analytical Chemistry* **72**(17), 4029-4032.
- Bao, Huiming et al.** 2000, Anomalous ¹⁷O compositions in massive sulphate deposits on the Earth. *Nature* **406**, 176-178.
- Farquhar, J., **Bao, Huiming** & Thiemens, M. H., 2000, Atmospheric influence of Earth's earliest sulfur cycle. *Science* **289**, 756-758.
- Wing, S. L.; **Bao, Huiming**; & Koch, P. L., 2000, An early Eocene cool period? Evidence for continental cooling during the warmest part of the Cenozoic. In: Huber, Brian T., editor, *Warm climates in Earth history*. Cambridge : University of Cambridge, p. 197-237.
- Bao, Huiming**, Koch, P. L., and Thiemens, M. H., 2000, Oxygen isotope composition of ferric oxides from recent soil, hydrologic, and marine environments. *Geochim. Cosmochim. Acta* **64** (11), 2221-2231.

1999

- Bao, Huiming**, Koch, P. L., and Rumble, D. III , 1999, Paleocene/Eocene climatic variation in western North America: Evidence from the δ¹⁸O of pedogenic hematite. *Geological Society of America Bulletin*. **111**, 1405-1415.
- Bao, Huiming** and Koch, P. L., 1999, Oxygen isotope fractionation in ferric oxide-water systems: Low temperature synthesis. *Geochim. Cosmochim. Acta* **63**, 599-613.

1998

- Bao, Huiming**, Koch, P. L. and Hepple, R., 1998, Hematite and calcite coatings on fossils. *Journal of Sedimentary Research A*, v. **68**, p. 273-287.

PhD Dissertation, Princeton University, 1998

Title: **Ferric oxides and oxyhydroxides: Oxygen isotope systematics and paleoclimatic reconstruction**

1997 and earlier (selected)

- Shen, J.W., Yu, C.M., and **Bao, Huiming**, 1997, A Late-Devonian (Famennian) Renalcis-epiphyton reef at Zhaijiang, Guilin, South China. *Facies*, **37**: p. 195-209.
- Wu, Qingyu, Mu, Xinan; and **Bao; Huiming**, 1994, Gaseous and liquid hydrocarbons produced from thermal degradation of two kinds of calcareous algae. *Acta Micropalaeontologica Sinica*, **11**(1). DOI: CNKI:SUN:WSGT.0.1994-01-008
- Bao, Huiming**, 1993, Some crypt habitats and cryptobionts in Late Devonian algal mounds in Guilin, south China. *Acta Micropalaeontologica Sinica*, **10**(2): 181-190.
- Sha, J., Zhang, L., Hui, L., Xu, S. and **Bao, Huiming**, 1992, The closure age of the late Paleozoic rift in Hohxil, Qinghai. *Acta Micropalaeontologica Sinica*, **9**, 177-182.
- Bao, Huiming**, 1992, Middle Devonian Rothpletzella stromatolites from Yangshuo, Guangxi (China). *Acta Micropalaeontologica Sinica*, **9**(4): 397-407.

INSTITUTIONS BEING INVITED TO GIVE TALKS (LAST EIGHT YEARS)

2018: >10 invited talks (including UTK, Harvard, PKU, ...)

2017: 3 CAS institutes and 5 universities in China
2016: University of St. Andrews; Princeton University
2015: Peking University; Chinese Academy of Sciences (CAS)
2014: Tokyo Institute of Technology; University of Southern Mississippi; Chinese Academy of Sciences (CAS)
2013: Tulane University
2012: University of Manitoba
Chinese Academy of Sciences
2011: Harvard University; University of Texas Arlington; University of Washington; University of Arkansas; Chinese Academy of Science
2010: Florida State University; Chinese Academy of Science (Guiyang Institute of Geochemistry, Nanjing Institute of Geology and Palaeontology)

KEY-NOTE AND INVITED SPEAKERS IN MEETINGS (LAST EIGHT YEARS)

2017: *Deciphering atmospheric sulfate formation pathways using triple-oxygen and quadruple-sulfur isotope compositions: knowns, unknowns, and mysteries*; The 11th Conference on Geochemistry at Earth's Surface, Guiyang; **Invited Talk**; *High-dimensional stable isotope signatures: Principle and applications in studying air, water, and soils*; Nanjing stable isotope ecology symposium; **Invited Talk**
2016: *Triple Isotope relationships: Principle and Applications*, Goldschmidt Yokohama; **Keynote**
2013: *Geological records of secondary atmospheric sulfate: A review*, AGU Fall Meeting 2013, **Invited talk**
2013: *Direct Atmospheric O₃ and O₂ signatures from the deep past and their first-order pattern*. Goldschmidt Conference, Florence 2013, **Keynote Speaker**
2012: *A three-dimensional isotope tale of extreme sulfate redox cycling in two lakes*. AGU Fall Meeting 2012, **Invited talk**
2012: *The Marinoan ¹⁷O-Depletion (MOSD) Event: Singularity, Duration, and Synchronicity of the Deglaciation*. Geological Society of London, Fermor Meeting, London. Spet. 2012, **Invited Keynote**.
2010: *Triple Oxygen Isotope Composition of Sulfate: A time capsule for Earth's O₂, O₃, and H₂O*. AGU Fall Meeting 2010, **Invited talk**.

EXTERNAL FUNDING

(All listed \$\$ amounts were/are Bao's shares, unless specified)

Active Funding

PI

Amount: US\$250K per year; **self-generated from service analysis** in the lab per year.

PI

Chinese Academy of Sciences (CAS)

"Origin and Evolution of Plate Tectonics"

Amount: >CNY 300K (>US\$45K) per year.

Duration: 2016-2020.

PI

National Natural Science Foundation of China (NNSFC)

High-dimensional stable isotope effect during vaporization in planetary conditions

Amount: CNY ~¥800,000 (~ US\$120,000)

Duration: May 2014- May 2019

Previous Funding**PI**

Short-Term Qian-Ren Project start-up fund, Chinese Academy of Sciences

Amount: CNY ¥500,000 (= US\$80,000)

Duration: May 2014- May 2017

PI

NSF Geomicrobiology & Low-Temperature Geochemistry, EAR-1251824

Title: "**Incorporation and elimination of molecular oxygen signal in sulfate: Experiments and modeling**"

Amount: \$348,244

Duration: July 15, 2013 to June 30, 2016

PI

NSF EAR-Instrumentation and Facility Program, EAR-1312284

Title: "**Acquisition and Upgrade of Research Equipment at Oxy-Anion Stable Isotope Consortium at Louisiana State University**"

Amount: \$409,167

Duration: Aug. 15, 2013 to Dec. 31, 2015

PI

NASA Contract Analysis Award

Analysis of carbonate and sulfate minerals in meteoritic materials

Amount: \$115,844

Duration: Sept. 15, 2013 to Sept. 14, 2015

PI

NASA Exobiology program: NNX12AD82G

Title: "**The ¹⁷O record of the Neoproterozoic snowball Earth in Kimberley, Western Australia**" Amount: \$167,604

Duration: Jan. 1, 2012 to Dec. 31, 2013

PI

NSF Low-Temperature Geochemistry Program (EAR-0952057)

Title: "**The origin of ¹⁷O-depleted barite in Neoproterozoic cap carbonates in South China**"

Amount: US\$269,644

Duration: 07-01-2010 to 06-31-2013

Co-PI

DOE (DE-FG02-12ER16296)

“Support for Travel expenses and Registration Fees for Graduate Students and Postdoctoral Fellow to attend International Conference on Isotopomers 2012 Meeting, Washington, June 18-22, 2012” (PI Douglas Rumble)

PI

Petroleum Research Fund - Type AC (48343-AC2)

Title: **“Experimental sulfate triple oxygen isotope geochemistry”**

Amount: \$100,000

Duration: 07-2008 to 08-2011

PI

Oversea Scholar Collaboration Fund, Natural Science Foundation of China (NSFC)

Title: **“Oxygen-17 anomalies in Neoproterozoic China”** (41374-G2)

Amount: ¥200,000 (~ US\$30,000)

Duration: 01-2009 to 12-2010

Collaborator

Natural Science Foundation of China (NSFC, Chinese NSF)

Title: **"Origin of nitrate and sulfate in arid to semi-arid salt basins in northwestern China"**

Bao-group's international travel, lodging, fieldwork, and analytical expenses were covered by the project that has a total of ¥ 530,000 (~ US\$80,000).

Duration: 06-01-2008 to 12-31-2010

PI

Economic Development Assistantship (EDA) from the State of Louisiana:

Title: **“Total isotope composition of natural perchlorate”**

Amount: \$100,000

Duration: 08-2006 to 05-2010

PI

Petroleum Research Fund - Type G:

Title: **“The total sulfate isotope compositions of photolysis origin: Clue from the 3.2 Ga Fig Tree barites”**

Amount: \$35,000

Duration: 9-1-2004 to 8-31-2007

PI

NSF-EAR Petrology & Geochemistry:

Award No. EAR-0408986

Title: "Sulfate ¹⁷O Anomalies in Cenozoic Volcaniclastic Deposits in the Northern High Plains, North America"

Amount: \$200,000

Duration: June 1, 2004 to May 31, 2007

PI

NSF IF-EAR (Instrumentation and Facility -- Earth Sciences):
Award No. EAR-0129793
Title: "Acquisition of a CO₂-Laser Fluorination System and a Mass Spectrometer System for Multiple Stable Isotope Analyses"
Amount: From NSF: \$235,919; Cost-share from LSU: \$221,035.
Duration: 2-28-2002 to 2-28-2005

PI

NSF OPP (Office of Polar Program); Award No. OPP-0125842
Title: "Collaborative Research: Multiple Isotope Analyses of Soil Sulfate and Nitrate in the Antarctic Dry Valleys"
Amount: \$210,838 + 12,500 (new REU award in 2004)
Duration: 4-1-2002 to 3-31-2005

CURRENT POSTDOC AND GRADUATE STUDENTS:

Haiyang Luo, PhD.

SUPERVISED POSTDOCS AND GRADUATE STUDENTS:

Yuyang He, **PhD**, 2018: "*High-Dimensional Isotope Relationships*".
Ziran Wei, **M.Sc.**, 2016: "*Oxygen isotope geochemistry of phosphate from igneous rock weathering profiles*".
Justin Hayles, **PhD** 2016: "*Triple isotope geochemistry*"; **NSF Postdoctoral Fellow 2018** (the 1st and only in departmental history).
Bryan Killingsworth, **PhD**, 2014: "*Earth system responses recorded in sulfate oxygen and sulfur isotopes at the dawn of multicellular life and today*"; **Marie Curie Fellow 2015** (the 1st and only in departmental history).
Dustin Boyd, **M.Sc.** 2015: "*Oxygen isotope composition of phosphate along vertical weathering profiles that developed on igneous rocks: Testing modern analogues for identifying terrestrial life in ancient paleosols*".
Liu, Changjie, **M.Sc.** 2012: "*Origin of pyrite nodules at the top of the Nantuo diamictites, southern China*".
Sun, Tao, **PhD**, 2011: "*Non-mass dependent isotope fractionation: An application in a hyperarid environment and a set of experiments on thermal diffusion*". **NASA Postdoctoral Fellow 2011** (the 1st and only in departmental history).
Kohl, Issaku E., **PhD.**, 2011: "*Oxidation of reduced sulfur compounds: a triple-oxygen isotope perspective*".
Peng, Yongbo, **PhD**, 2010: "*Stories of the Proterozoic Earth: Paleoproterozoic Chuanlinggou acritarchs and Neoproterozoic ¹⁷O-depleted barite*".
Howell, Katie J., **M.Sc.**, 2006: "*Caliche as a geologic repository for atmospheric sulfate*".
Jenkins, Kathryn A., **M.Sc.**, 2005: "*Sulfur and oxygen isotope characterization of an Eocene playa deposit, northern High Plains, and rainwater sulfate, Baton Rouge, USA*".

VISITING SCHOLARS AND VISITING STUDENTS:

Hao Yan: Institute of Geochemistry, CAS, 2018-
Xuefei Liu: Chinese Univ. of Geosciences-Beijing, 2018-
Yanli Li: Henan Polytech University, 2018-
Haoran Ma: Peking University, 2018-
Xin Wang: South China Sea Institute of Oceanology, CAS, 2018-2019 (2 months)
Matthew Warke, University of St. Andrews, Nov-Dec. 2018
Frasier L. Liljestrand: Harvard University, Boston, U.S.A. 2018
Yixuan Zhang: Peking University, 2018 (1 months)
Xindi Lu: Peking University, 2018 (1 months)
Yang Peng: Peking University, Beijing, China, 2016-2017
Ting Ni: Peking University, Beijing, China, 2017-2018
Mao Tang: Institute of Geochemistry, CAS, 2017-2018 (12 months)
Qiaohui Pi: Guilin Polytech University, Guilin, China, 2017-2018
Jiasheng Wang: Chinese University of Geosciences, Wuhan, 2016
Shanggui Gong: Chinese Academy of Sciences, 2016 -2018
Lianfang Wei: Chinese Academy of Sciences, 2016-2017
Bing Shen & Lin Dong: Peking University, 2016
Chengguo Guan, Chinese Academy of Sciences, 2016-2017
Dong Zhang, visiting scholar, Henan Polytech, 2016-2017
Liwei Zhang, visiting scholar, Henan Polytech, 2016-2017
Qunhui Yang: Tongji University, Shanghai, China, 2016 (3 months)
Jie Zhao: Chinese University of Geosciences, Wuhan, 2016-2017 (3 months)
Peter Crockford, visiting PhD, McGill University, 2013,2014, 2016
Linying Chen: Shanghai Ocean University, Shanghai, 2015-2017 (two years)
Dong Feng: Chinese Academy of Sciences, 2015-2016 (3 months)
Jingjing Bai: Chinese University of Geosciences, Beijing, 2015-2016 (2 months)
Xianjun Xie, visiting scholar, Chinese University of Geosciences, Wuhan; 2014-2015
Luhua Xie, visiting scholar, Chinese Academy of Sciences, 2014 (6 months)
Qinxian Wang, visiting PhD, Chinese Academy of Sciences, 2012-2014
Taiyi Luo, visiting scholar, Chinese Academy of Sciences, 2014 (12 months)
Xiaoqian Li, visiting PhD, Chinese University of Geosciences, Wuhan; 2010-2011
Chuanming Zhou, Chinese Academy of Sciences, 2009-2010 (3 months);
Yun Liu, Chinese Academy of Sciences, 2009 (two months); 2017-2018 (4 months)

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

American Geophysical Union (AGU)
Geochemical Society
AAAS

PROFESSIONAL SERVICE

2019-2021: Member of International Advisor committee on Center of Excellence on Planetary Sciences of Chinese Academy of Sciences

2018: Convener of ISI2018 (The 9th International Symposium of Isotopomers)

NASA Review Panel: 2015

U.S. National Science Foundation (NSF) review panels: 2011, 2012, 2013; 2014

Reviewing ~20 manuscripts for professional journals (*Science*, *Nature*, *PNAS*, *Geology*, *Natural Geosciences*, *GCA*, *EPSL*, ...) and ~10 proposals for NSF, NASA, International Space Agency.

Co-convener of ISI 2012: The Sixth International Symposium on Isotopomers at Washington D.C.

Co-convener of AGU sessions