Emerging Investigator Series

International Association of GeoChemistry (IAGC)

Wang Zheng, June 2021

Zheng, Wang is a "Peiyang scholar" professor of the School of Earth System Science at Tianjin University. He graduated from the University of Science and Technology of China with a B.S. degree, and received his PhD degree from Trent University (Canada). He has been a postdoctoral fellow at Oak Ridge National Lab and University of Toronto, and has worked as a research associate at Arizona State University. His research area is metal stable isotope geochemistry. Particularly, he focuses on the mechanism of metal isotope fractionation, the application of mercury isotopes in tracing the biogeochemical cycle of mercury, and the application of metal isotopes as proxies to understand the evolution of Earth's environment and life. He received the 18th "Hou Defeng" young scientist award from the Chinese Society for Mineralogy, Petrology and Geochemistry in 2020. His recent paper entitled "**Mercury stable isotopes reveal the sources and transformations of atmospheric Hg in the high Arctic**" was published in *Applied Geochemistry*, and is featured with the Emerging Investigator Series.

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Mercury stable isotopes reveal the sources and transformations of atmospheric Hg in the high Arctic

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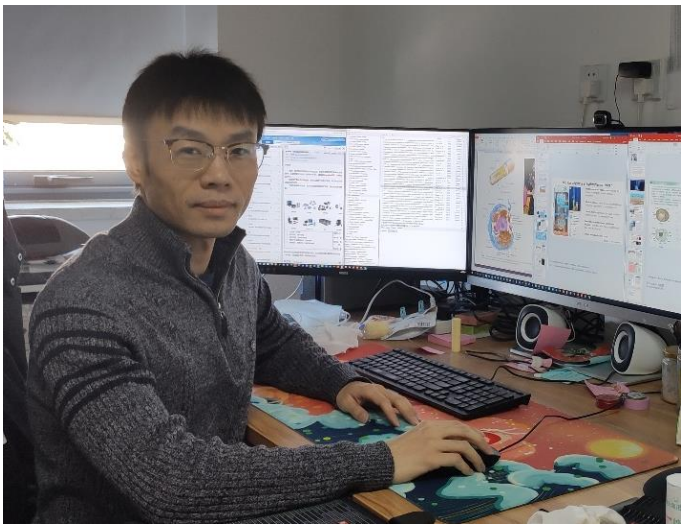
What excites you most about the work published in Applied Geochemistry?

This work is a collaborative work with the University of Toronto and the Environment and Climate Change Canada, and is the first work to systematically study the Hg stable isotope compositions of various atmospheric Hg species and surface snow in the high Arctic (Alert, Canada), together with high-resolution temporal variations of atmospheric Hg speciation across multiple years. Arctic plays a critical role in the global Hg cycle as a sink of Hg, and, in response to rapid global warming, may become an emerging source of Hg due to release from permafrost and glaciers. Our study shows that Hg isotopes provide an effective way to trace the source and transformation of Hg in the Arctic, and thus have the potential to help reveal the complex interaction between human impact, climate change and Hg cycling in the future.

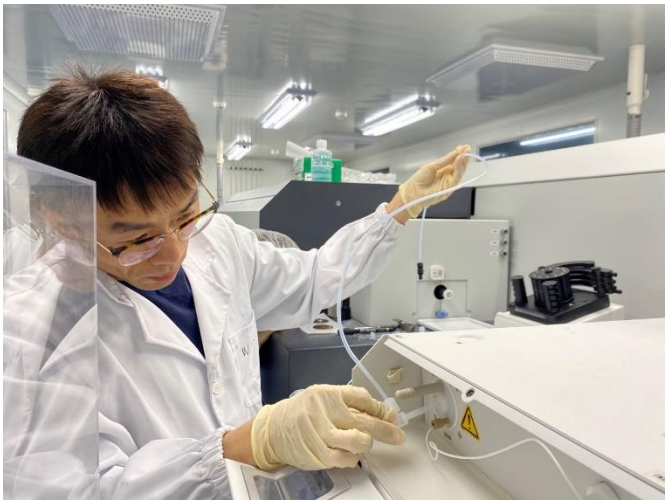
You were awarded the Hou Defeng young scientist award. Can you tell us more about this award?

Prof. HOU Defeng is one of the greatest geochemists in China with a proud influence. The "Hou Defeng" young scientist award is presented by the Chinese Society for Mineralogy, Petrology and Geochemistry every two years to early-career scientists for their outstanding contribution to either mineralogy, petrology or geochemistry. It is one of the best-known awards for young scientists in Earth science in China. Many of the previous awardees have later grown to be the leading scientists in their research fields. It is my great honor to receive this award. It encourages me to keep working hard and stay enthusiastic about my research.



Can you talk about the ongoing research that your group is working on?

My research is focusing on the mechanism and application of metal stable isotope fractionation. The current research projects are: 1. The mechanism of mass independent fractionation (MIF) of metal isotopes (particularly Hg). For example, we are carrying out experiments to simulate the photochemical processes in modern and ancient environments and studying the pattern and mechanism of MIF during these processes; 2. Reconstruction of the co-evolution history of Earth and life using redox sensitive metal isotopes (e.g., Hg, Re, Mo, U). For example, we found that Hg isotopes can record ocean euxinia (anoxic and sulfide-rich condition), which is linked to the extinction and evolution of life; 3. Tracing the sources, transport, and transformation of metal contaminants (e.g., Hg, Cd, Pb) in modern environments, such as industrial contaminated fields, using their stable isotopes. These projects are founded by the National Natural Science Foundation of China (NSFC) and the National Key Research and Development Program of China.



As an early career investigator, are there any advice or experience that you want to share with the audience of Applied Geochemistry?

For early-career scientists, starting their own research program is not easy and takes time. I feel very fortunate to join the School of Earth System Science at Tianjin University, as it provides me excellent instrument facilities and research platforms, which enable me to start my research quickly. There may be periods when you feel your progress is slow, but it is important to stay patient and persistent as good science always takes time. In China, the evaluation for scientific achievement is now more and more based on the scientific contribution and quality of research. I think

this is a good thing and will encourage young scientists to make more important scientific breakthrough in the future.

The aim of the **IAGC Emerging Investigator Series** is to highlight excellent work by independent researchers in their early career that bring new insights into the field of geochemistry or to promote geochemical applications. Multidisciplinary work related to applied geochemistry, biogeochemical processes, and environmental geochemistry are also highly welcomed. Featured articles as well as the authors as emerging investigators will be extensively advertised to diverse disciplines and communities through multiple platforms of the journal and the International Association of GeoChemistry.