Geochemical Society

www.geochemsoc.org

NOMINATE A COLLEAGUE FOR A GS AWARD

Each year, the GS seeks to celebrate and share outstanding achievements in geochemistry through our awards and special lectures program. The society's awards, named after some of the pioneers in the field, provide an opportunity to reflect on the remarkable accomplishments of our colleagues and serve as an inspiration for future trailblazers.

Help us recognize the innovative scientists who are making major contributions to the field by nominating someone for the Goldschmidt, Patterson, Clarke, Treibs, and Hayes Awards. Anyone (except those involved in the award selection process) may submit a nomination, including early career and senior scientists. Nominations for these awards, as well as the Geochemistry Fellow nominations, are due by October 30, 2025. Visit www.geochemsoc.org/honors for more information.

The society is accepting nominations through October 30 for the following awards:

The V. M. Goldschmidt Award is the society's highest honor. This award is presented annually for major achievements in geochemistry over a career.

The Clair C. Patterson Award is presented annually for an innovative breakthrough in environmental geochemistry of fundamental significance within the last decade, particularly in service to society.

The F.W. Clarke Award honors a single outstanding contribution to geochemistry or cosmochemistry by an early-career scientist.

The Alfred Treibs Award, presented by the Geochemical Society's Organic Geochemistry Division, is given for major achievements, over several years, in organic geochemistry.

The John M. Hayes Award given by the Organic Geochemistry Division to a mid-career scientist for outstanding accomplishments that draw together multiple fields of investigation to advance biogeochemical science.

GOLDSCHMIDT 2026 CALL FOR SESSIONS AND WORKSHOPS

The 2026 Goldschmidt Conference will be held from July 12 to 17, in Montreal, Québec, Canada. The science program is built from the ground up with contributions from scientists around the world. We invite the entire geochemistry community to submit suggestions for sessions and workshops to help form the program. The call for sessions will come in early September 2025, and the deadline for proposals is October 15, 2025.

MONTRÉAL GOLDSCHMIDT® 12–17 July 2026

Visit 2026.goldschmidt.info for more information.

GS ANNUAL REPORT

Learn about GS activities in the annual Report to Our Members. This report summarizes the society's vision, accomplishments, and major activities, as well as provides a financial overview of the past year. Details include how the GS supports our community through publications, the Goldschmidt Conference, awards and outreach programs. Read the report at www.geochemsoc.org/about/governance/report-our-members.

ANNOUNCING GOLDSCHMIDT 2028

The Geochemical Society and the European Association of Geochemistry are pleased to announce that the 2028 Goldschmidt Conference will be held in Tokyo, Japan, on July 9–14, 2028. The Geochemical Society of Japan will serve as the principal co-sponsor of the conference. It will be held at the Tokyo International Forum in the center of Japan's largest city. To receive updates about upcoming Goldschmidt conferences, sign up for the mailing list or follow us on social media at www.geochemsoc.org/events/goldschmidtconference.

Japan Association of Mineralogical Sciences

https://jams-mineral.jp/english/jams/

DEEP IRON INCORPORATION FROM EARTH'S CORE INTO THE MANTLE VIA IRON–WATER EXCHANGE

At the Earth's core–mantle boundary (CMB), an environment characterized by extreme pressure and temperature, dynamic interactions occur between the liquid metallic core and the overlying mantle minerals. Seismological observations have revealed the presence of chemical heterogeneities in the lowermost mantle, known as the ultra-low velocity zones (ULVZs), where seismic waves propagate exceptionally slowly. To understand the origin of these anomalous regions, many researchers—including teams from Japan—have conducted extensive investigations. Here, we briefly introduce a new hypothesis proposed by Kawano et al. (2024) to explain the origin of ULVZs.

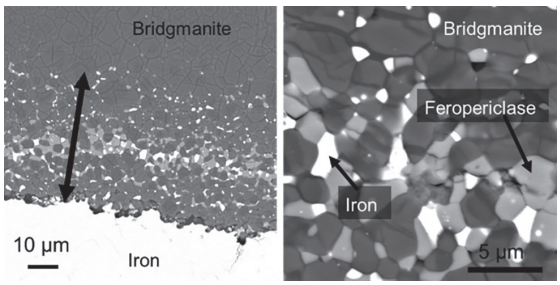

Figure 1 Back-scattered electron (BSE) images showing the formation of an iron-rich layer between bridgmanite and iron under hydrous conditions.

Using a multi-anvil apparatus, researchers simulated the conditions at the core–mantle boundary, where liquid iron interacts with mantle minerals under high-pressure and high-temperature conditions. The experiments revealed that iron migrates into the mineral phase only in the presence of water (Fig. 1). Furthermore, the thickness of the iron-rich reaction layer was found to increase with the water content in the sample, highlighting the critical role of water in facilitating iron transport.

In the present experiments, a chemical reaction between water and iron led to the formation of ferropericlase via the reaction:

$$3Fe + H_2O \rightarrow FeO + 2FeH.$$

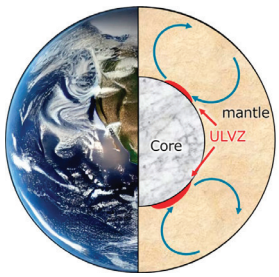

Figure 2 Schematic illustration of ULVZ formation through iron–water exchange.

This reaction initiates the growth of the FeO-rich layer through water-induced iron oxidation (hereafter referred to as iron–water exchange). The diffusivity of iron in ferropericlase is known to be several orders of magnitude higher than in silicate minerals. In the actual mantle, ferropericlase formed through iron–water exchange could lead to iron enrichment over several kilometers at the base of the mantle in the presence of water (Fig. 2). These findings provide a plausible explanation for the seismic signatures observed in ULVZs, supporting a model of whole-mantle convection accompanied by deep water cycling from the crust to the core throughout Earth's history (Nishi et al. 2014).

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REFERENCES

Kawano K and 5 coauthors (2024) Extensive iron–water exchange at Earth's core–mantle boundary can explain seismic anomalies. Nature Communications 15: 8701, doi: 10.1038/s41467-024-52677-9

Nishi M and 6 coauthors (2014) Stability of hydrous silicate at high pressures and water transport to the deep lower mantle. Nature Geoscience 7: 224-227, doi: 10.1038/ngeo2074