Sat. Sep 16, 2023

Oral presentation | S1: Dynamics of igneous processes (Special Session)

9:00 AM - 10:00 AM JST | 12:00 AM - 1:00 AM UTC | 820 Sugimoto Campus

S1: Dynamics of igneous processes (Special Session)

Chairperson:Morihisa Hamada(JAMSTEC), Shumpei Yoshimura(Hokkaido University)

9:00 AM - 9:15 AM JST | 12:00 AM - 12:15 AM UTC

[S1-01] Dehydration and heating processes during magma transportation decoded from chemical zonings in peridotite xenolith from Ichinomegata, NE Japan

*Yuto SATO[1], Eiichi Takahashi[1], Kazuhito Ozawa[2] (1. GIGCAS, 2. AORI, Univ. Tokyo)

9:15 AM - 9:30 AM JST | 12:15 AM - 12:30 AM UTC

[S1-02] **Post-entrapment density modification of fluid inclusions by elastic deformation: Implications for fluid inclusion geobarometry of peridotites**

*Yuuki HAGIWARA[1], Ross John Angel[2], Junji Yamamoto[3], Rosario Esposito[4], Matteo Alvaro[5] (1. JAMSTEC, 2. IGG-CNR, 3. Kyushu University, 4. University of Milano-Bicocca, 5. University of Pavia)

9:30 AM - 9:45 AM JST | 12:30 AM - 12:45 AM UTC

[S1-03] Textural and chemical changes of alkali feldspar during disequilibrium melting of granite

*Hiroshi KAWABATA[1], Shigeru YAMASHITA[2] (1. Kochi University, 2. Okayama University)

9:45 AM - 10:00 AM JST | 12:45 AM - 1:00 AM UTC

[S1-04] Experimental simulation of crystallite and spherulite in rhyolitic lava

*Tamotsu Sugawara[1], Shumpei Yoshimura[1] (1. Hokkaido Univ. Sci.)

[zoom] Zoom

Oral presentation | R5: Extraterrestrial materials

9:00 AM - 12:00 PM JST | 12:00 AM - 3:00 AM UTC | 821 Sugimoto Campus

R5: Extraterrestrial materials

Chairperson:Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Shogo Tahibana

9:00 AM - 9:15 AM JST | 12:00 AM - 12:15 AM UTC

[R5-01] Shock deformation microstructures in rutile

*Yuhei Umeda[1], Yuma Nagai[1], Naotaka Tomioka[2], Toshimori Sekine[3], Masashi Miyakawa[4], Takamichi Kobayashi[4], Hitoshi Yusa[4], Takuo Okuchi[1] (1. Kyoto Univ. KURNS., 2. JAMSTEC, 3. HPSTAR, 4. NIMS)

9:15 AM - 9:30 AM JST | 12:15 AM - 12:30 AM UTC

[R5-02] Microstructures of calcite deformed by 3-D shock experiments

*Naotaka TOMIOKA[1], Kosuke Kurosawa[2], Haruka Ono[3], Takafumi Niihara[4], Takafumi Matsui[2] (1. KOCHI, JAMSTEC, 2. PERC, Chiba Inst. Tech., 3. Res. Org. Sci. Tech., Ritsumeikan Univ., 4. Dept App. Sci., Okayama Sci. Univ.)

9:30 AM - 9:45 AM JST | 12:30 AM - 12:45 AM UTC

[R5-03] FIB-TEM observation of silica minerals coexisting in achondrites

*Atsushi TAKENOUCHI[1], Youhei Igami[2], Akira Miyake[2], Haruka Ono[3], Takashi Mikouchi[4], Akira Yamaguchi[5] (1. The Kyoto Univ. Museum, 2. Kyoto Univ., 3. Ritsumeikan Univ., 4. The Univ. Museum, The Univ. of Tokyo, 5. Natl. Inst. of Polar Res.)

9:45 AM - 10:00 AM JST | 12:45 AM - 1:00 AM UTC

[R5-04] Assessment of Shock Melting of Martian Meteorites as Deduced from Short Time Heating Experiments of Basalt and Martian Soil Simulants

[Presentation award entry]

*Takeru Sato[1], Takashi Mikouchi[2] (1. Univ. of Tokyo, 2. Univ. of Tokyo)

10:00 AM - 10:15 AM JST | 1:00 AM - 1:15 AM UTC

[R5-05] Observation of internal structure of diamond in carbon grains in DaG 999 ureilite.

*Masahiro YASUTAKE[1], Megumi Matsumoto[3], Junya Matsuno[2], Akira Tsuchiyama[2,4], Kentaro Uesugi[1], Akihisa Takeuchi[1] (1. JASRI, 2. Ritsumeikan Univ., 3. Tohoku Univ., 4. CAS/GIG)

10:15 AM - 10:30 AM JST | 1:15 AM - 1:30 AM UTC

[3Lecture-201-11-6add] 休憩

10:45 AM - 11:00 AM JST | 1:45 AM - 2:00 AM UTC

[R5-07] Nano-CT and TEM analysis of impact melt splashes and microcraters on asteroid Ryugu samples

*Megumi MATSUMOTO[1], Junya Matsuno[2], Akira Tsuchiyama[2,3], Tomoki Nakamura[1], Yuma Enokido[1], Mizuha Kikuiri[1], Masahiro Yasutake[4], Kentaro Uesugi[4], Akihisa Takeuchi[4], Satomi Enju[5], Shota Okumura[6], Itaru Mitsukawa[6], Sun Mingqi[3], Akira Miyake[6], Hayabusa2 initial analysis core-team (1. Tohoku Univ., 2. Ritsumeikan Univ., 3. GIG, CAS, 4. JASRI, 5. Ehime Univ., 6. Kyoto Univ.)

11:00 AM - 11:15 AM JST | 2:00 AM - 2:15 AM UTC

[R5-08] Origins of olivine grains in CI chondrites and asteroid Ryugu samples as inferred from their major and minor element compositions

*Takashi MIKOUCHI[1], Hideto Yoshida[1], Minami Masuda[1], Michael E. Zolensky[2] (1. Univ. of Tokyo, 2. NASA/JSC)

11:15 AM - 11:30 AM JST | 2:15 AM - 2:30 AM UTC

[R5-09] On the relationship between modal abundances of minerals and degrees of aqueous alteration of the brecciated fragments in the Orgueil CI chondrite

*Minami Masuda[1], Takashi Mikouchi[2], Michael Zolensky[3] (1. UTokyo Sci., 2. UTokyo UMUT/Sci., 3. NASA JSC)

11:30 AM - 11:45 AM JST | 2:30 AM - 2:45 AM UTC

[R5-10] Mineralogical diversity of the C1 lithologies in the Kaidun meteorite

[Presentation award entry]

*Kenei OGIYA[1], Takashi Mikouchi[2], Michael E Zolensky[3] (1. Univ. of Tokyo, 2. Univ. of Tokyo , 3. NASA)

11:45 AM - 12:00 PM JST | 2:45 AM - 3:00 AM UTC

[R5-11] Classification of subtype 3.0 chondrites

*Makoto Kimura[1], Michale K. Weisberg[2], Akira Yamaguchi[1] (1. National Institute of Polar Rsearch, 2. City University of New York)

[zoom] Zoom

Oral presentation | R3: High-pressure science and deep Earth's material

9:00 AM - 12:00 PM JST | 12:00 AM - 3:00 AM UTC | 822 Sugimoto Campus

R3: High-pressure science and deep Earth's material

Chairperson:Takaaki Kawazoe(Hiroshima University), Takeshi Sakai(Ehime University), Masayuki Nishi(Osaka University)

9:00 AM - 9:15 AM JST | 12:00 AM - 12:15 AM UTC

[R3-01] First-principles investigations of the polysomatism of antigorite under pressure

*Jun TSUCHIYA[1], Sayako Inoue[1], Taiga Mizoguchi[1] (1. Ehime University)

9:15 AM - 9:30 AM JST | 12:15 AM - 12:30 AM UTC

[R3-02] The change in the hydrous mechanism of enstatite with Al incorporation

*Moe Sakurai[1], Hiroshi Sakuma[2], Noriyoshi Tsujino[3], Eiichi Takahashi[4], Katsuyuki Kawamura[5] (1. Okayama Univ., 2. NIMS, 3. JASRI, 4. GIG, CAS, 5. Tokyo Tech.)

9:30 AM - 9:45 AM JST | 12:30 AM - 12:45 AM UTC

[R3-03] H and Al incorporation mechanisms in stishovite: New insights from multi-nuclear NMR and first-principles calculation

*Xianyu XUE[1], Masami Kanzaki[1] (1. Okayama University)

9:45 AM - 10:00 AM JST | 12:45 AM - 1:00 AM UTC

[R3-04] Influence of high oxygen fugacity on melting temperature of wadsleyite and chemical composition of the generated melts

[Presentation award entry]

*Kazutaka YAMAGUCHI[1], Takaaki Kawazoe[1], Toru Inoue[1], Takeshi Sakai[2] (1. Hiroshima Univ. Adv, 2. Ehime Univ. Geodynamics)

10:00 AM - 10:15 AM JST | 1:00 AM - 1:15 AM UTC

[R3-05] Anoisotropic electrical resistivity in $FeTiO_3$ ilmenite, compressibility and spin state under high pressure.

*Takamitsu YAMANAKA[1] (1. Chinese HPSTAR)

10:15 AM - 10:30 AM JST | 1:15 AM - 1:30 AM UTC

[R3-06] Melting relations at the mantle transition zone to uppermost lower mantle in the MgO-SiO_2-H_2O system

*Toru INOUE[1], Kota OKUMURA[1], Takaaki KAWAZOE[1], Sho KAKIZAWA[2], Masamichi NODA[3], Tetsuo IRIFUNE[4], Toru SHINMEI[4] (1. Hiroshima Univ.y, 2. JASRI, 3. Delaware State Univ., 4. Ehime Univ. GRC)

10:30 AM - 10:45 AM JST | 1:30 AM - 1:45 AM UTC

[3Lecture-301-11-7add] 休憩

10:45 AM - 11:00 AM JST | 1:45 AM - 2:00 AM UTC

[R3-07] **Water content profile of magma in the mantle transition zone predicted from high-pressure, high-temperature experiments**

[Presentation award entry]

*Yusuke Egi[1], Toru Inoue[1], Kota Okumura[1], Takaaki Kawazoe[1] (1. Hiroshima Univ. Sci.)

11:00 AM - 11:15 AM JST | 2:00 AM - 2:15 AM UTC

[R3-08] Elastic anomaly at the spin transition in ferropericlase: Revisited by GHz-DAC Ultrasonic Velocity Measurement newly developed

*Takuto Kato[1], Akira Yoneda[1], Tadashi Kondo[1], Daisuke Yamazaki[2] (1. Osaka Univ. Sci., 2. Okayama. IPM)

11:15 AM - 11:30 AM JST | 2:15 AM - 2:30 AM UTC

[R3-09] Iron-Water Exchange at the Earth's Core-Mantle Boundary

[Presentation award entry]

*Katsutoshi Kawano[1], Masayuki Nishi[1], Sho Kakizawa[2], Toru Inoue[3], Hideharu Kuwahara[4], Tadashi Kondo[1] (1. Osaka Univ. Sci, 2. JASRI, 3. Hiroshima Univ. Sci, 4. Ehime Univ. GRC)

11:30 AM - 11:45 AM JST | 2:30 AM - 2:45 AM UTC

[R3-10] Increase of hydrogen-induced volume expansion by incorporation of Si into iron and the effect in estimated hydrogen content in the Earth's core

[Presentation award entry]

*Yuichiro MORI[1], Hiroyuki Kagi[1], Katsutoshi Aoki[1], Masahiro Takano[1], Sho Kakizawa[2], Asami Sano[3], Ken-ichi Funakshi[4] (1. UTokyo, 2. JASRI, 3. J-PARC Center, JAEA, 4. CROSS)

11:45 AM - 12:00 PM JST | 2:45 AM - 3:00 AM UTC

[R3-11] Post-spinel transition of Fe_2SiO_4 ahrensite at high pressure and high temperature

*Masaki AKAOGI[1,2], Natsuki MIYAZAKI[1], Taisuke TAJIMA[1], Hiroshi KOJITANI[1] (1. Gakushuin Univ. Sci. , 2. Univ. Tokyo Sci.)

[zoom] Zoom

Oral presentation | R6: Plutonic rocks, volcanic rocks and subduction factory

10:15 AM - 12:00 PM JST | 1:15 AM - 3:00 AM UTC | 820 Sugimoto Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson:Takashi Yuguchi, Atsushi Kamei

10:15 AM - 10:30 AM JST | 1:15 AM - 1:30 AM UTC

[R6-01] Igneous activity formed meta-granitoid in the Tenmondai rocks of the Lützow-Holm complex, East Antarctica

*Atsushi KAMEI[1], Momo Ichikawa[1], Tomokazu Hokada[2], Kenichiro Tani[3], Ippei Kitano[4], Sotaro Baba[5], Nugroho I. Setiawan[6], Prayath Nantasin[7], Davaa-ochir Dashbaatar[8], Yoichi Motoyoshi[2] (1. Shimane University, 2. National Institute of Polar Research, 3. National Museum of Nature and Science, 4. Hokkaido University, 5. University of the Ryukyus, 6. Universitas Gadjah Mada, 7. Kasetsart University, 8. Mongolian University of Science and Technology)

10:30 AM - 10:45 AM JST | 1:30 AM - 1:45 AM UTC

[R6-02] Mafic veins in the mantle section recovered during Oman Drilling Project: products of backarc spreading?

*Yuji ICHIYAMA[1], Hisatoshi Ito[2], Akihiro Tamura[3], Tomoaki Morishita[3] (1. Chiba University, 2. Central Research Institute of ElectricPower Industry, 3. Kanazawa University)

10:45 AM - 11:00 AM JST | 1:45 AM - 2:00 AM UTC

[R6-03] Muographic study of the oceanic crust-mantle density structure of the Oman Ophiolite

*Susumu UMINO[1], Hiroyuki Tanaka[2], László Oláh[2], Dezső Varga[4], Tomoaki Morishita[1], Yoshihiro Hiramatsu[1], Yuki Kusano[3] (1. Kanazawa University, 2. University of Tokyo, 3. AIST, 4. Wigner Research Center for Physics)

11:00 AM - 11:15 AM JST | 2:00 AM - 2:15 AM UTC

[R6-04] Magma genesis of the Iwafune diorites, Ibaraki Prefecture

[Presentation award entry]

*Haruki YAMAZAKI[1,2], Terumi EJIMA[1,2], Yoshiaki KON[2] (1. Shinshu Univ. Sci., 2. GSJ, AIST)

11:15 AM - 11:30 AM JST | 2:15 AM - 2:30 AM UTC

[R6-05] Zircon U-Pb age combined with trace element geochemistry constraining the source of Miocene granitoids of the Kagoshima Prefecture, Japan

*Hafiz Ur REHMAN[1], Marimo NAKABAYASHI[1], Yuki OTA[1], Kaushik DAS[2], Chung Sun LIN[3], Hao YANG LEE[3], Daisuke YAMASHITA[4], Hiroshi YAMAMOTO[1] (1. Kagoshima Uni., 2. Hiroshima Uni., 3. IES, Academia Sinica, Taiwan, 4. Satsumasendai Kosh. Mus.)

11:30 AM - 11:45 AM JST | 2:30 AM - 2:45 AM UTC

[R6-06] Chronological re-examination of the Kanmon Group, Southwest Japan: and remaining unsolved problems

*Yukiyasu TSUTSUMI[1], Ryo Hasegawa[2], Yukio Isozaki[3] (1. National Museum of Nature and Science, 2. FUJIFILM Business Innovation Corp., 3. Graduate school of Arts and Sciences, University of Tokyo)

11:45 AM - 12:00 PM JST | 2:45 AM - 3:00 AM UTC

[R6-07] U-Pb zircon age of granitoids in the Aoyama area, Ryoke belt, SW Japan

*Fumiko HIGASHINO[1], Tetsuo KAWAKAMI[1], Shuhei SAKATA[2], Shunpei Kudo[1], Yohei IGAMI[1] (1. Kyoto Univ. Sci., 2. Univ. Tokyo)

[zoom] Zoom

Oral presentation | R5: Extraterrestrial materials

2:00 PM - 3:00 PM JST | 5:00 AM - 6:00 AM UTC | 821 Sugimoto Campus

R5: Extraterrestrial materials

Chairperson:Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Shogo Tahibana

2:00 PM - 2:15 PM JST | 5:00 AM - 5:15 AM UTC

[R5-12] Chemical Composition of Circumstellar Amorphous Silicate Dust: Condensation Experiments in the Na-Mg-Al-Si-Ca-Fe-Ni-O System

*Hanako Enomoto[1], Aki Takigawa[1] (1. UTokyo)

2:15 PM - 2:30 PM JST | 5:15 AM - 5:30 AM UTC

[R5-13] Survivability of presolar SiC grains in the protosolar disk: An experimental study

*Daiki YAMAMOTO[1], Aki TAKIGAWA[2], Shogo TACHIBANA[2] (1. Kyushu University, 2. University of Tokyo)

2:30 PM - 2:45 PM JST | 5:30 AM - 5:45 AM UTC

[R5-14] Antarctic micrometeorites containing pseudomorphs of melanophlogite: Dust from the sub-surface ocean of icy satellites or from an unknown type of trans-Neptunian objects?

*Takaaki NOGUCHI[1], Takuya Mitsunari[2,3], Rikako Matsumoto[4,5], Akira Yamaguchi[6], Naoya Imae[6], Toru Matsumoto[1], Toru Araki[7], Hayato Yuzawa[7], Akira Miyake[1] (1. Kyoto Univ. Sci., 2. Ibaraki Univ. Sci., 3. Mitsubishi Elect. Soft. Co., 4. Kyushu Univ. Sci., 5. Ine T.H., 6. NIPR, 7. IMS)

2:45 PM - 3:00 PM JST | 5:45 AM - 6:00 AM UTC

[R5-15] **Studies of Earth's minerals and rocky mixtures beyond Earth**

*Yasunori MIURA[1] (1. Post Yamaguchi Univ. Sci.)

[zoom] Zoom

Oral presentation | R3: High-pressure science and deep Earth's material

2:00 PM - 3:00 PM JST | 5:00 AM - 6:00 AM UTC | 822 Sugimoto Campus

R3: High-pressure science and deep Earth's material

Chairperson:Takaaki Kawazoe(Hiroshima University), Takeshi Sakai(Ehime University), Masayuki Nishi(Osaka University)

2:00 PM - 2:15 PM JST | 5:00 AM - 5:15 AM UTC

[R3-12] High temperature formation of the oxygen-rich Martian core

*Eiji OHTANI[1], William F McDonough[1,2] (1. Tohoku University, 2. University of Maryland)

2:15 PM - 2:30 PM JST | 5:15 AM - 5:30 AM UTC

[R3-13] Microtexture evolution of pure aluminum severely deformed at static high pressures

*Takuo OKUCHI[1,2], Yuto TANAKA[2,1], Naotaka TOMIOKA[3], Tomokazu SANO[4], Tomoki MATSUDA[4], Kazuto ARAKAWA[5], Yusuke SETO[6] (1. Kyoto Univ. KURNS, 2. Kyoto Univ. Mech. Eng., 3. Kochi JAMSTEC, 4. Osaka Univ. Eng., 5. Shimane Univ. NEXTA, 6. Osaka Metropolitan Univ. Sci.)

2:30 PM - 2:45 PM JST | 5:30 AM - 5:45 AM UTC

[R3-14] **Quantitative chemical analysis of the fine textures of natural and synthetic materials using ATEM**

*Kiyoshi FUJINO[1], Naotaka TOMIOKA[2], Hiroaki OHFUJI[3] (1. Non, 2. JAMSTEC, 3. Tohoku Univ.)

2:45 PM - 3:00 PM JST | 5:45 AM - 6:00 AM UTC

[R3-15] Synthesis of polycrystalline diamond from glassy carbon by direct conversion at high pressure and temperature

Chinatsu Ogawa[1], *Tetsuo Irifune[1], Sayako Inoue[1], Takehiro Kunimoto[1], Toru Shinmei[1], Akimasa Suzumura[2], Shoichi Itoh[2] (1. Ehime University, 2. Kyoto University)

[zoom] Zoom

Poster presentation | S1: Dynamics of igneous processes (Special Session)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

S1: Dynamics of igneous processes (Special Session)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[S1P-01] Injection of K_2O-rich magma into magma chambers beneath Myoko volcano

*Morihisa HAMADA[1], Estelle F. ROSE-KOGA[2], Kenneth T. KOGA[2], Kenji SHIMIZU[1], Takayuki USHIKUBO[1], Hideo HARADA[3], Andereas AUER[4], Yoshiaki YAMAGUCHI[3] (1. JAMSTEC, 2. ISTO, CNRS-Universite d'Orleans, 3. Shinshu Univ., 4. Shimane Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[S1P-02] Repressurization of vesiculated magma inferred from volatile distribution in groundmass glass

*Shumpei YOSHIMURA[1] (1. Hokkaido University)

Poster presentation | R3: High-pressure science and deep Earth's material

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R3: High-pressure science and deep Earth's material

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-01] Carbon isotope analysis of diamond/graphite recovered from high-pressure experiments by NanoSIMS and IRMS

Hideaki Kawamura[1], *Hiroaki OHFUJI[1], Satish-Kumar Satish-Kumar[2], Kiran Sasidharan[2], Akizumi Ishida[1], Kouhei Sasaki[3], Naoto Takahata[3], Kotaro Shirai[3], Akio Suzuki[1] (1. Tohoku Univ. Sci, 2. Niigata Univ. Sci., 3. Univ. Tokyo, AORI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-02] Diamond formation at upper mantle of ice giants

Yoshiki Kenmochi[1], *Takeshi SAKAI[1], Hirokazu Kadobayashi[2] (1. Ehime University, 2. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-03] Post-antigorite reaction in cold slab

*Tomoaki KUBO[1], Shingo Yoshida[1], Rikuto Honda[1], Yuta Hiramoto[1], Noriyoshi Tsujino[2], Sho Kakizawa[2], Yuji Higo[2] (1. Kyushu University, 2. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-04] On the low temperature plasticity of metastable olivine

[Presentation award entry]

*Rikuto Honda[1], Tomoaki Kubo[1], Noriyoshi Tsujino[2], Yuji Higo[2], Sho Kakizawa[2], Yuki Shibazaki[3], Yu Nishihara[4] (1. Kyushu Univ., 2. JASRI, 3. KEK, 4. Ehime Univ. GRC)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-05] Deformation property of Wüstite polycrystals developed by large strain deformation experiments under lower mantle pressures using rotational DAC

[Presentation award entry]

*Bunrin Natsui[1], Shintaro Azuma[1], Keishi Okazaki[2], Kentaro Uesugi[3], Masahiro Yasutake[3], Saori Kawaguchi[3], Ryuichi Nomura[4], Kenji Ohta[1] (1. Tokyo Tech, 2. Hiroshima Univ., 3. JASRI, 4. Kyoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-06] High-temperature conditions for the rotational diamond anvil cell by near-infrared heating method

*Shintaro AZUMA[1], Keishi Okazaki[2], Kentaro Uesugi[3], Masahiro Yasutake[3], Bunrin Natsui[1], Eranga Jayawickrama[2], Ryuichi Nomura[4] (1. Tokyo Institute of Technology, 2. Hiroshima University, 3. JASRI, 4. Kyoto University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-07] Measurements of local stress and high pressure phase transition of Fe in in-situ TEM indentation experiments

*Akira MIYAKE[1], Yohei Igami[1], Ryuichi nomura[1] (1. Kyoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-08] Real-time measurement of DAC specimen length: Direct measurement of back-to-back distance between diamond anvils and elastic deformation analysis of diamond anvils.

*Akira Yoneda[1], Takuto Kato[1] (1. Osaka Univ. Sci.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-09] Density measurement of Ni under high pressure and high temperature using laser-heated DAC combined with X-ray absorption method

*Hidenori TERASAKI[1], Hiroyuki KAMINA[1], Ryo TSURUOKA[2], Tadashi KONDO[2], Akira YONEDA[2], Ko MORIOKA[1], Moe SAKURAI[1], Seiji KAMADA[3], Saori I KAWAGUCHI[4] (1. Okayama University, 2. Osaka University, 3. Tohoku University, 4. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-10] Density measurement of FeS by X-ray absorption method with laser-heated diamond anvil cell

[Presentation award entry]

*Ko Morioka[1], Hidenori Terasaki[1], Hiroyuki Kamina[1], Ryo Tsuruoka[2], Tadashi Kondo[2], Akira Yoneda[2], Moe Sakurai[1], Saori Kawaguchi[3] (1. Okayama Univ. Sci., 2. Osaka Univ. Sci., 3. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-11] Neutron diffraction measurements and molecular dynamics simulations on FeS hydrides

[Presentation award entry]

*Masahiro Takano[1], Hiroyuki Kagi[1], Yuichiro Mori[1], Katsutoshi Aoki[1], Sho Kakizawa[2], Asami Sano[3], Riko Iizuka[4], Taku Tsuchiya[5] (1. The Univertsity of Tokyo, 2. JASRI, 3. J-PARC, 4. Waseda University, 5. Ehime University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-12] Melting relations in the system Fe-FeS-FeO at 3 GPa

Kosuke Tsuji[1], *Satoru URAKAWA[1], Hidenori Terasaki[1] (1. Okayama University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-13] Bismuth at high temperature and high pressure

*Shigeaki ONO[1] (1. Japan Agency for Marine-Earth Science and Technology (JAMSTEC))

Poster presentation | R5: Extraterrestrial materials

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R5: Extraterrestrial materials

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R5P-01] Structural Evolution of Dynamically-compressed Germanium Dioxide

*Hiroto Araga[1,2], Yuhei Umeda[1,2], Takamichi Kobayashi[3], Hitoshi Yusa[3], Yusuke Seto[4], Takuo Okuchi[1,2] (1. Kyoto Univ. Eng., 2. KURNS Kyoto Univ., 3. NIMS, 4. Osaka Metropolitan Univ. Sci.)

Poster presentation | R6: Plutonic rocks, volcanic rocks and subduction factory

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-01] Compositional changes in closed and open systems of igneous rocks from northern part of Mt. Shaku-dake, northern Kyushu, SW Japan

*Keisuke ESHIMA[1] (1. Yamaguchi Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-02] Formation of upper-most crust in volcanic belt: Example for Cretaceous volcano–plutonic complex, Hyogo Prefecture, southwest Japan

*Masaaki OWADA[1], Shunsuke Fukuda[1], Atsushi Kamei[2] (1. Yamaguchi University, 2. Shimane University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-03] **Intrusion and emplacement processes of adakitic magma into the shallow crust: A case study of the Sakainokami plutonic body, Kitakami mountains, northeast Japan**

[Presentation award entry]

*Satoshi SUZUKI[1], Nobuo ASAI[1], Kazuo NAKASHIMA[1], Yasuhiro OGITA[2], Tatsunori YOKOYAMA[2], Shuhei SAKATA[3], Takeshi OHNO[4], Takashi YUGUCHI[5] (1. Yamagata Univ., 2. Japan Atomic Energy Agency, 3. Univ of Tokyo. , 4. Gakushuin Univ. , 5. Kumamoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-04] Identification of multiple components of noble gas isotopes in back-arc lithospheric mantle

*Lena Yokokura[1], Hirochika Sumino[1], Takeshi Kuritani[2], Yuuki Hagiwara[3], Junji Yamamoto[4] (1. The University of Tokyo, 2. Hokkaido University, 3. JAMSTEC, 4. Kyushu University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-05] Three-dimensional evaluation of internal structures contributing to mass transport distributed in minerals: micropores in K-feldspar in the Toki granite, central Japan.

*Mai Nonaka[1,2], Takashi Yuguchi[3] (1. Yamagata University, 2. Japan Atomic Energy Agency, 3. Kumamoto University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-06] Magma source and evolution process for Quaternary Magmas from Kuju Volcanoes, Kyushu Island, Southwest Japan Arc.

*Soma Yamanaka[1], Tomoyuki Shibata[3], Ryotaro Fujihara[1], Tatsuki Orito[1], Taichi Heijima[1], Masako Yoshikawa[3], Tomo Shibata[2] (1. Hiroshima Univ. Sci., 2. Fukuoka Univ. Sci., 3. Hiroshima Univ. Sci. & Tech.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-07] Geochemical features of the Early Miocene Hachiya Formation
in the Chuno Area, Gifu Prefecture, Japan

[Presentation award entry]

*Seiya Saijou[1], Toshiro Takahashi[2] (1. Niigata Univ. Sci., 2. Niigata Univ)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-09] Cathodoluminescence pattern of quartz and quantitative determination of titanium and aluminum concentration within quartz crystals in the Tono plutonic complex, Kitakami mountains

*Yasuhiro OGITA[1,2], Takenri KATO[3], Takashi YUGUCHI[4] (1. Yamagata Univ., 2. JAEA, 3. Nagoya Univ., 4. Kumamoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-10] Cathodoluminescence patterns of quartz crystals in granite and their titanium concentrations: implication to crystallization process of quartz in the magma chamber

*Asuka Kato[1], Takenori Kato[2], Yasuhiro Ogita[1,3], Takashi Yuguchi[4], Eiji Sasao[3] (1. Yamagata Univ. , 2. Nagoya Univ, 3. JAEA, 4. Kumamoto Univ)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-11] Petrography and Rb-Sr mineral age of mafic dyke rocks on Niban-Rock, Lützow-Holm Complex (LHC), East Antarctica.

*Tomoharu MIYAMOTO[1], Yamashita Katsuyuki[2], Daniel J. Dunkley[3], Toshiaki Tsunogae[4], Mutsumi Kato[5] (1. Kyushu University, 2. Okayama University, 3. Polish Academy of Sciences, 4. Univ. of Tsukuba, 5. Chiba University)

Poster presentation | R8: Metamorphic rocks and tectonics

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R8: Metamorphic rocks and tectonics

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-01] Structural and petrological study of layering in the Horoman Peridotite Complex, Hokkaido, Japan

[Presentation award entry]

*Aya Hihara[1], Miki Tasaka[1], Keisuke Kurihara[1], Tatsuhiko Kawamoto[1], Hajime Taniuchi[2] (1. Shizuoka University, 2. National Institute of Advanced Industrial Science and Technology)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-02] Geology and petrography of metamorphic rocks in Sibuyan Island, Romblon, Philippines

[Presentation award entry]

*John Kenneth Badillo[1], Gabriel Theophilus Valera[1], Betchaida Payot[1] (1. University of the Philippines Diliman)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-03] **The metamorphic condition of the Oshima peninsula, in the southern part of Yamaguchi prefecture: Implications for metamorphic process and regional structure of the Ryoke metamorphic belt, west Seto Inland sea area**

[Presentation award entry]

*Zejin LU[1], Masaaki Owada[1] (1. Yamaguchi University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-04] Study of flexural slip formed by plate subduction

[Presentation award entry]

*Haruki Yoshiasa[1], Jun-ichi ANDO[2], SARKAR Dyuti Prakash[2], DAS Kaushik[2], GHOSH Gautam[3] (1. Hiroshima Univ. , 2. Hiroshima Univ., 3. Presidency Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-05] Electron diffuse scattering in omphacite from lawsonite eclogite xenolith in Colorado Plateau: A preliminary report

[Presentation award entry]

*Ryo Fukushima[1], Tatsuki Tsujimori[1,2], Nobuyoshi Miyajima[3], Tiziana Boffa-Ballaran[3], Giacomo Criniti[3], Catherine McCammon[3] (1. Tohoku Univ. Sci., 2. CNEAS, Tohoku Univ., 3. BGI, Univ. Bayreuth)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-06] **Exhumation process of serpentinite in the Sangun-Renge belt exposed at Sasaguri, Fukuoka prefecture**

[Presentation award entry]

*Swarnaa ANNADURAI MUNUSAMY[1], Jun-ichi ANDO[1,2], Yuki IWASAKI[3], Dyuti Prakash SARKAR[1,2], Kaushik DAS[1,2], Seiichiro UEHARA[4] (1. Hiroshima Univ., 2. HiPeR, Hiroshima, 3. NIPPON STEEL CORP., 4. The Kyushu Univ. Museum)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-07] Mineral and bulk compositions of an outcrop showing a symmetric sequence composed of peridotite and mafic-rock layers of Horoman peridotite, Japan

[Presentation award entry]

*Keisuke Kurihara[1], Tatsuhiko Kawamoto[1], Aya Hihara[1], Miki Tasaka[1], Hajime Taniuchi[2], Takeshi Kuritani[3], Akiko Matsumoto[3] (1. Shizuoka Univ., 2. AIST, 3. Hokkaido Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-08] Mechanism of seismic fault generation involving in pseudotachylyte formation in ductile regime: examples from Sarwar-Junia Fault Zone, India

[Presentation award entry]

*Junya OKAZAKI[1], Jun-ichi Ando[1], Kaushik Das[1] (1. Hiroshima University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-09] Water content distributions in dynamically recrystallized quartz grains in granitoid mylonites: A case of an inner shear zone in the Ryoke Belt in the Kishiwada area, Osaka

*Takemasa Norimura[1], Junichi Fukuda[1] (1. Osaka Metrop. Univ. Geosci.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-10] **Deformation microstructures and slip systems developed in olivine from the Petit-spot peridotite xenoliths: Insights on deformation mechanisms and anisotropy of upper mantle**

*Dyuti Prakash SARKAR[1,2], Norikatsu Akizawa[3], Jun-ichi Ando[1,2], Masako Yoshikawa[1,2] (1. Hiroshima University, 2. HiPeR, 3. The University of Tokyo)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-11] Novel automated method for estimating the peak temperature from the crystallinity of carbonaceous material using EM algorithm

*Yoshihiro NAKAMURA[1], Tarojiro MATSUMURA[1], Kazuhiro MIYAZAKI[1] (1. AIST)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-12] Zircon U-Pb ages of the Oura igneous complex, northern Kyoto area, SW Japan and its tectonic correlation

*Kosuke KIMURA[1], Kenta Kawaguchi[2], Nobuhiko Nakano[2], Tatsuro Adachi[2], Kaushik Das[3] (1. Osaka Metropolitan Univ. Sci., 2. Kyushu Univ. , 3. Hiroshima Univ. Sci.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-13] Metasomatic syenite at the interface between charnockite and calc-silicate granulite, Eastern Ghats Belt, India: Mineral-chemical characterization and its implications during orogenesis

*Kaushik DAS[1,4], Proloy Ganguly[2], Sankar Bose[3,4] (1. Hiroshima University, 2. Durgapur Government College, Department of Geology, Durgapur, India, 3. Presidency University, Kolkata, India, 4. HiPeR, Hiroshima)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-14] Petrography of V and Zn-rich gahnite-sillimanite-muscovite gneiss from Menipa, Sør Rondane Mountains, East Antarctica

*Tatsuro ADACHI[1], Tetsuo Kawakami[2], Fumiko Higashino[2], Masaoki Uno[3] (1. Kyushu University, 2. Kyoto University, 3. Tohoku University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-15] Unraveling the Link Between Deformation, Metamorphism, and Fluid Flow in the Archean Dharwar Craton, Southern India

*Sreehari LAKSHMANAN[1], Kiran Sasidharan[2], Satish-Kumar Madusoodhan[2], Tsuyoshi Toyoshima[2] (1. Shimane Uni., 2. Niigata Uni.)

3:30 PM - 5:00 PM JST | 6:30 AM - 8:00 AM UTC | 820 Sugimoto Campus

一般普及講演

3:30 PM - 5:00 PM JST | 6:30 AM - 8:00 AM UTC

[E-06] 一般普及講演

[zoom] Zoom

3:30 PM - 5:00 PM JST | 6:30 AM - 8:00 AM UTC | 822 Sugimoto Campus

理事会

3:30 PM - 5:00 PM JST | 6:30 AM - 8:00 AM UTC

[E-07] 理事会

Oral presentation | S1: Dynamics of igneous processes (Special Session)

Sat. Sep 16, 2023 9:00 AM - 10:00 AM JST | Sat. Sep 16, 2023 12:00 AM - 1:00 AM UTC | 820 Sugimoto Campus

S1: Dynamics of igneous processes (Special Session)

Chairperson:Morihisa Hamada(JAMSTEC), Shumpei Yoshimura(Hokkaido University)

9:00 AM - 9:15 AM JST | 12:00 AM - 12:15 AM UTC

[S1-01] Dehydration and heating processes during magma transportation decoded from chemical zonings in peridotite xenolith from Ichinomegata, NE Japan

*Yuto SATO[1], Eiichi Takahashi[1], Kazuhito Ozawa[2] (1. GIGCAS, 2. AORI, Univ. Tokyo)

9:15 AM - 9:30 AM JST | 12:15 AM - 12:30 AM UTC

[S1-02] **Post-entrapment density modification of fluid inclusions by elastic deformation: Implications for fluid inclusion geobarometry of peridotites**

*Yuuki HAGIWARA[1], Ross John Angel[2], Junji Yamamoto[3], Rosario Esposito[4], Matteo Alvaro[5] (1. JAMSTEC, 2. IGG-CNR, 3. Kyushu University, 4. University of Milano-Bicocca, 5. University of Pavia)

9:30 AM - 9:45 AM JST | 12:30 AM - 12:45 AM UTC

[S1-03] Textural and chemical changes of alkali feldspar during disequilibrium melting of granite

*Hiroshi KAWABATA[1], Shigeru YAMASHITA[2] (1. Kochi University, 2. Okayama University)

9:45 AM - 10:00 AM JST | 12:45 AM - 1:00 AM UTC

[S1-04] Experimental simulation of crystallite and spherulite in rhyolitic lava

*Tamotsu Sugawara[1], Shumpei Yoshimura[1] (1. Hokkaido Univ. Sci.)

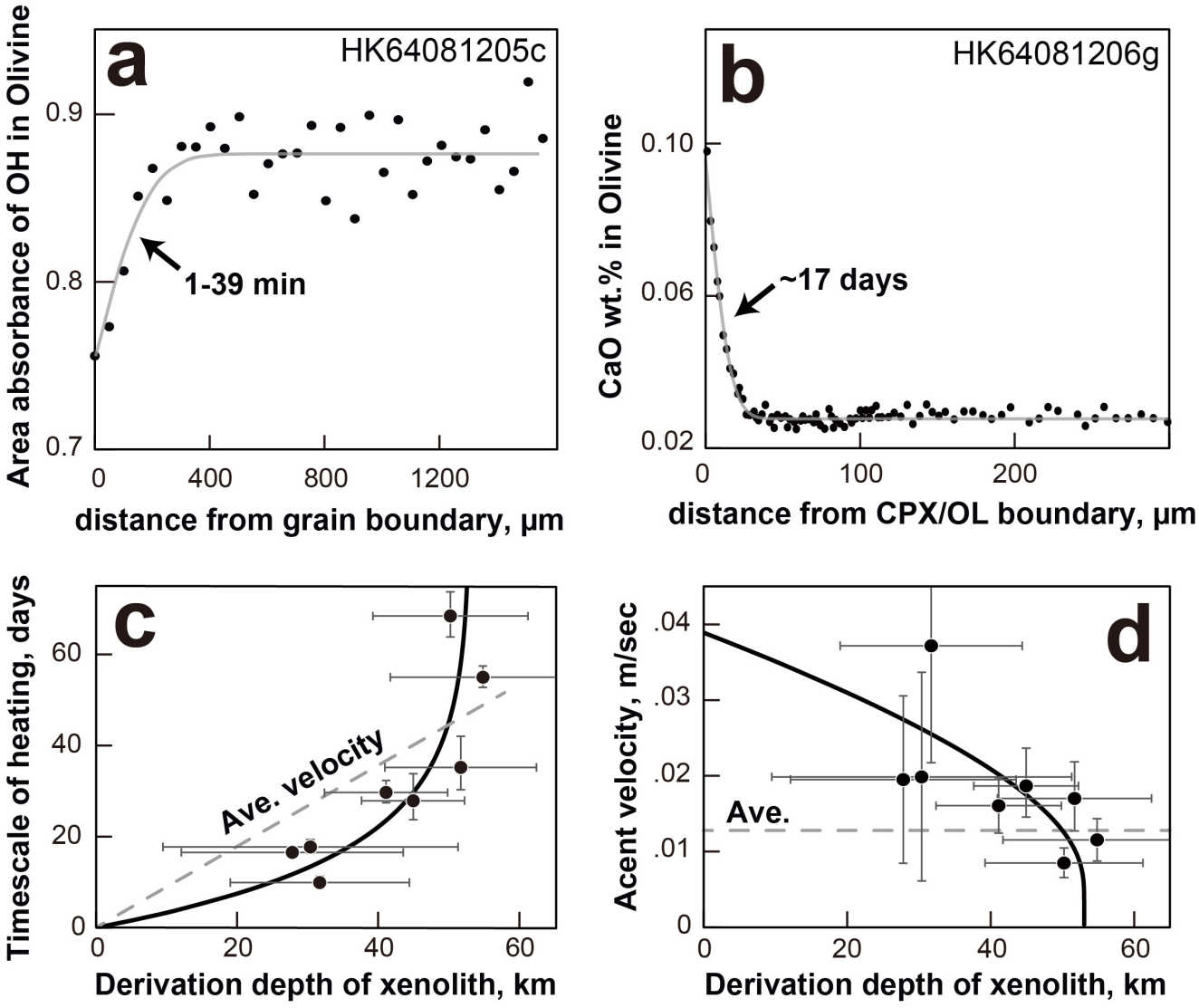
[zoom] Zoom

Dehydration and heating processes during magma transportation decoded from chemical zonings in peridotite xenolith from Ichinomegata, NE Japan

*Yuto SATO[1], Eiichi Takahashi[1], Kazuhito Ozawa[2]

1. GIGCAS, 2. AORI, Univ. Tokyo

Keywords: mantle xenolith, magma transportation, chemical zoning, water content, olivine



Post-entrapment density modification of fluid inclusions by elastic deformation: Implications for fluid inclusion geobarometry of peridotites

*Yuuki HAGIWARA[1], Ross John Angel[2], Junji Yamamoto[3], Rosario Esposito[4], Matteo Alvaro[5]

1. JAMSTEC, 2. IGG-CNR, 3. Kyushu University, 4. University of Milano-Bicocca, 5. University of Pavia

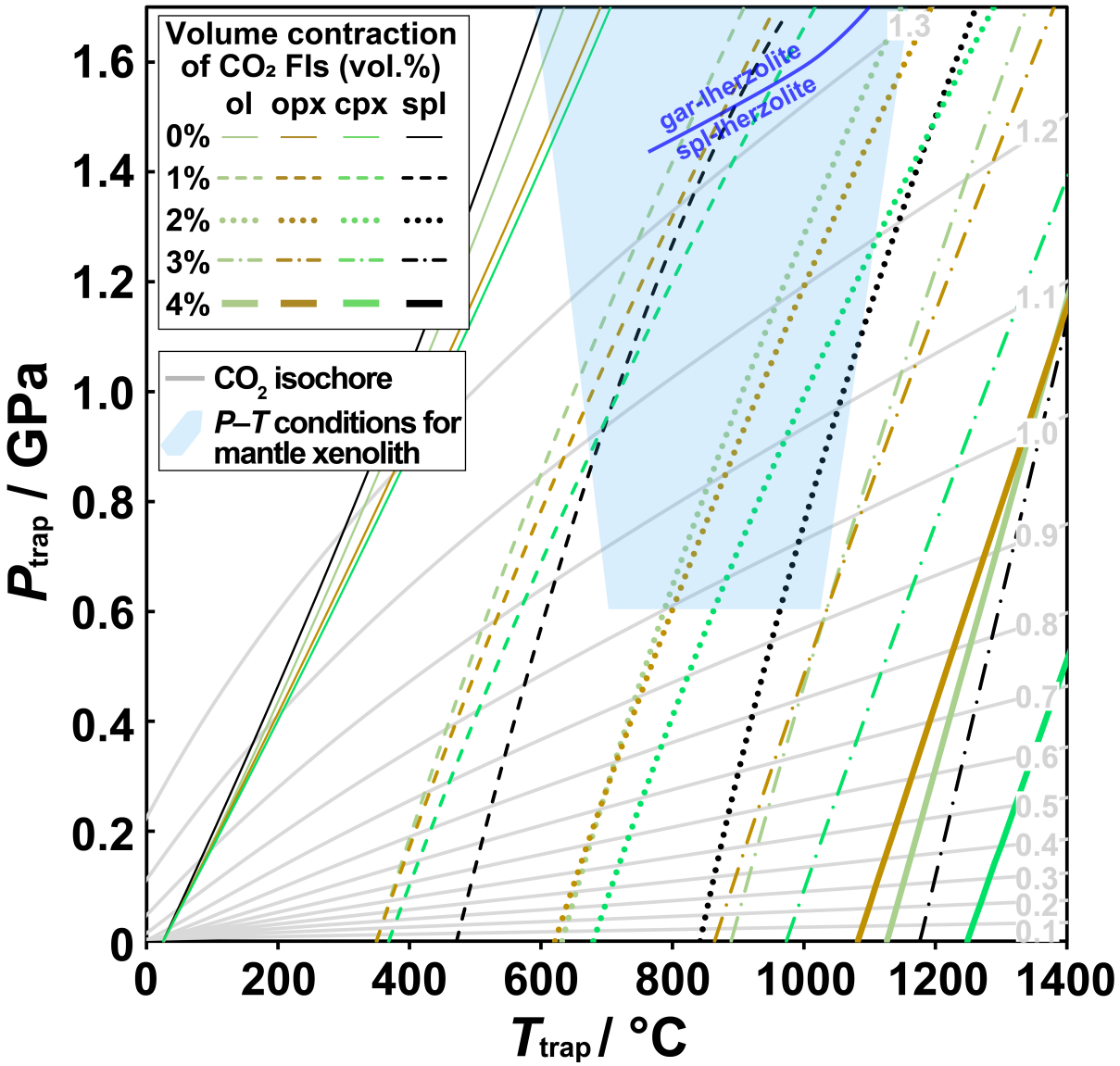
Changes in fluid inclusion (FI) density (ρ_{inc}) due to elastic deformation of the host mineral have long been recognized as a possible source of systematic error in the estimation of trapping pressures by FI geobarometry (e.g., Ermakov 1950), but it has been difficult to accurately assess the effect of elastic deformation on ρ_{inc}. However, recent improvements in elastic geobarometry theory (e.g., Angel et al. 2014; 2017) and equations of state of host minerals (e.g., Angel et al. 2018; Hagiwara et al. 2022) have allowed us to accurately assess the uncertainty that elastic deformation brings to FI geobarometry. Here, we evaluate the influence of elastic deformation on the estimation of the depth provenance by FI geobarometry, using peridotites as examples, and propose a correction method.

We show that, due to elastic deformation, the measured ρ_{inc} of FI trapped under typical *P-T* conditions of spinel-lherzolites are about 0–3% greater than the density at the *P-T* conditions of entrapment. Therefore, unless the effects of elastic deformation are corrected, trapping pressures will be slightly overestimated. Our results also demonstrate that differences in the elastic properties of the host minerals do not play any role in the widely reported mineral species dependence of measured ρ_{inc} (i.e., spinel > opx ~ cpx > olivine) in peridotites. Furthermore, it was also demonstrated that fluid density change by laser heating (Hagiwara et al. 2021a; 2021b) and cation ordering of spinel (Hagiwara et al. 2022) cannot explain this mineral species dependence. These results mean that ρ_{inc} of FIs in olivine, orthopyroxene, and clinopyroxene are reduced by factors other than elastic deformation because it is unlikely that any mechanism other than elastic deformation or cation ordering can increase the ρ_{inc}. Therefore, P_{trap} estimated using the FIs in spinel should be closer to the true entrapment pressures than those obtained from FIs in olivine, orthopyroxene, and clinopyroxene.

References

Angel et al. (2014) *Am Mineral*, **99**, 2146-2149; Angel et al. (2017) *Am Mineral*, **102**, 1957-1960; Angel et al. (2018) *Phys Chem Miner*, **45**, 95-113; Ermakov (1950) University of Kharkov Press, 460 pp.; Hagiwara et al. (2021a) *J. Raman Spectros.* **52**, 1744–1757; Hagiwara et al. (2021b) *Chem. Geol.* **559**, 119928; Hagiwara et al. (2022) *Contrib. Min. Petrol.* **177**

Keywords: Fluid inclusion, Geobarometry, Equation of state, Elastic deformation, Raman spectroscopy



トラップ条件(P_{trap}とT_{trap})から標準状態(0 GPaと25°C)まで*P-T*が低下する過程でolivine, opx, cpx, spinel中のCO_2流体包有物の体積が0, 1, 2, 3, 4%減少する等積変化線. 青い領域はマントル捕獲岩の典型的な由来P-T領域である(Hasterok & Chapman 2011). 灰色の曲線はCO_2の等密度線である(Pitzer and Sterner 1994).

Textural and chemical changes of alkali feldspar during disequilibrium melting of granite

*Hiroshi KAWABATA[1], Shigeru YAMASHITA[2]

1. Kochi University, 2. Okayama University

Keywords: Alkali feldspar, Disequilibrium melting

Experimental simulation of crystallite and spherulite in rhyolitic lava

*Tamotsu Sugawara[1], Shumpei Yoshimura[1]

1. Hokkaido Univ. Sci.

Keywords: Crystallization, Rhyolite, Spherulite, Crystallite

Oral presentation

S1: Dynamics of igneous processes (Special Session)

Chairperson:Morihisa Hamada(JAMSTEC), Shumpei Yoshimura(Hokkaido University)

Sat. Sep 16, 2023 9:00 AM - 10:00 AM 820 (Sugimoto Campus)

[zoom]Zoom

Zoom

Oral presentation | R5: Extraterrestrial materials

Sat. Sep 16, 2023 9:00 AM - 12:00 PM JST | Sat. Sep 16, 2023 12:00 AM - 3:00 AM UTC | 821 Sugimoto Campus

R5: Extraterrestrial materials

Chairperson:Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Shogo Tahibana

9:00 AM - 9:15 AM JST | 12:00 AM - 12:15 AM UTC

[R5-01] Shock deformation microstructures in rutile

*Yuhei Umeda[1], Yuma Nagai[1], Naotaka Tomioka[2], Toshimori Sekine[3], Masashi Miyakawa[4], Takamichi Kobayashi[4], Hitoshi Yusa[4], Takuo Okuchi[1] (1. Kyoto Univ. KURNS., 2. JAMSTEC, 3. HPSTAR, 4. NIMS)

9:15 AM - 9:30 AM JST | 12:15 AM - 12:30 AM UTC

[R5-02] Microstructures of calcite deformed by 3-D shock experiments

*Naotaka TOMIOKA[1], Kosuke Kurosawa[2], Haruka Ono[3], Takafumi Niihara[4], Takafumi Matsui[2] (1. KOCHI, JAMSTEC, 2. PERC, Chiba Inst. Tech., 3. Res. Org. Sci. Tech., Ritsumeikan Univ., 4. Dept App. Sci., Okayama Sci. Univ.)

9:30 AM - 9:45 AM JST | 12:30 AM - 12:45 AM UTC

[R5-03] FIB-TEM observation of silica minerals coexisting in achondrites

*Atsushi TAKENOUCHI[1], Youhei Igami[2], Akira Miyake[2], Haruka Ono[3], Takashi Mikouchi[4], Akira Yamaguchi[5] (1. The Kyoto Univ. Museum, 2. Kyoto Univ., 3. Ritsumeikan Univ., 4. The Univ. Museum, The Univ. of Tokyo, 5. Natl. Inst. of Polar Res.)

9:45 AM - 10:00 AM JST | 12:45 AM - 1:00 AM UTC

[R5-04] Assessment of Shock Melting of Martian Meteorites as Deduced from Short Time Heating Experiments of Basalt and Martian Soil Simulants

[Presentation award entry]

*Takeru Sato[1], Takashi Mikouchi[2] (1. Univ. of Tokyo, 2. Univ. of Tokyo)

10:00 AM - 10:15 AM JST | 1:00 AM - 1:15 AM UTC

[R5-05] Observation of internal structure of diamond in carbon grains in DaG 999 ureilite.

*Masahiro YASUTAKE[1], Megumi Matsumoto[3], Junya Matsuno[2], Akira Tsuchiyama[2,4], Kentaro Uesugi[1], Akihisa Takeuchi[1] (1. JASRI, 2. Ritsumeikan Univ., 3. Tohoku Univ., 4. CAS/GIG)

10:15 AM - 10:30 AM JST | 1:15 AM - 1:30 AM UTC

[3Lecture-201-11-6add] 休憩

10:45 AM - 11:00 AM JST | 1:45 AM - 2:00 AM UTC

[R5-07] Nano-CT and TEM analysis of impact melt splashes and microcraters on asteroid Ryugu samples

*Megumi MATSUMOTO[1], Junya Matsuno[2], Akira Tsuchiyama[2,3], Tomoki Nakamura[1], Yuma Enokido[1], Mizuha Kikuiri[1], Masahiro Yasutake[4], Kentaro Uesugi[4], Akihisa Takeuchi[4], Satomi Enju[5], Shota Okumura[6], Itaru Mitsukawa[6], Sun Mingqi[3], Akira Miyake[6], Hayabusa2 initial analysis core-team (1. Tohoku Univ., 2. Ritsumeikan Univ., 3. GIG, CAS, 4. JASRI, 5. Ehime Univ., 6. Kyoto Univ.)

11:00 AM - 11:15 AM JST | 2:00 AM - 2:15 AM UTC

[R5-08] Origins of olivine grains in CI chondrites and asteroid Ryugu samples as inferred from their major and minor element compositions

*Takashi MIKOUCHI[1], Hideto Yoshida[1], Minami Masuda[1], Michael E. Zolensky[2] (1. Univ. of Tokyo, 2. NASA/JSC)

11:15 AM - 11:30 AM JST | 2:15 AM - 2:30 AM UTC

[R5-09] On the relationship between modal abundances of minerals and degrees of aqueous alteration of the brecciated fragments in the Orgueil CI chondrite

*Minami Masuda[1], Takashi Mikouchi[2], Michael Zolensky[3] (1. UTokyo Sci., 2. UTokyo UMUT/Sci., 3. NASA JSC)

11:30 AM - 11:45 AM JST | 2:30 AM - 2:45 AM UTC

[R5-10] Mineralogical diversity of the C1 lithologies in the Kaidun meteorite

[Presentation award entry]

*Kenei OGIYA[1], Takashi Mikouchi[2], Michael E Zolensky[3] (1. Univ. of Tokyo, 2. Univ. of Tokyo , 3. NASA)

11:45 AM - 12:00 PM JST | 2:45 AM - 3:00 AM UTC

[R5-11] Classification of subtype 3.0 chondrites

*Makoto Kimura[1], Michale K. Weisberg[2], Akira Yamaguchi[1] (1. National Institute of Polar Rsearch, 2. City University of New York)

[zoom] Zoom

Shock deformation microstructures in rutile

*Yuhei Umeda[1], Yuma Nagai[1], Naotaka Tomioka[2], Toshimori Sekine[3], Masashi Miyakawa[4], Takamichi Kobayashi[4], Hitoshi Yusa[4], Takuo Okuchi[1]

1. Kyoto Univ. KURNS., 2. JAMSTEC, 3. HPSTAR, 4. NIMS

Shock response of minerals is an essential clue for understanding of deformation properties of rocks during natural impact events in the history of Earth and planets. Shock-compression experiments are the primary method for simulating such deformation process. Shock recovery experiments using a single-stage propellant were conducted for single crystal and powdered rutile to investigate the effect of heating related to porosity on the shock-induced deformation microstructures. X-ray diffraction (XRD) and transmission electron microscopy (TEM) analyses of the shocked single crystal rutile revealed that a high-density of stacking fault occurred on the (101) plane. The defect suggests that the dominant slip system in the plastic deformation of the crystal is {101}<01>. A part of the crystal is intergrown with the α-PbO_2 structure in a topotaxial relationship: $[010]_{Rt}$ // $[001]_{\alpha\text{-}PbO2}$. Based on topological analysis, the single crystal rutile would have transformed to the α-PbO_2 structure via the calcium-fluoride structure concomitantly with shear deformation. Meanwhile, the shocked powdered rutile consists mainly of particles with pervasive entangled dislocations and recrystallized particles, where the α-PbO_2 structure did not occur at all. Considering the absence of stacking faults, a possible dominant slip system in the shocked powdered rutile is {110}[001].

Keywords: Rutile, Shock recovery experiment, Deformation, Defect

Microstructures of calcite deformed by 3-D shock experiments

*Naotaka TOMIOKA[1], Kosuke Kurosawa[2], Haruka Ono[3], Takafumi Niihara[4], Takafumi Matsui[2]

1. KOCHI, JAMSTEC, 2. PERC, Chiba Inst. Tech., 3. Res. Org. Sci. Tech., Ritsumeikan Univ., 4. Dept App. Sci., Okayama Sci. Univ.

Keywords: Calcite, Shock experiments, Dislocations, Transmission electron microscopy

FIB-TEM observation of silica minerals coexisting in achondrites

*Atsushi TAKENOUCHI[1], Youhei Igami[2], Akira Miyake[2], Haruka Ono[3], Takashi Mikouchi[4], Akira Yamaguchi[5]

1. The Kyoto Univ. Museum, 2. Kyoto Univ., 3. Ritsumeikan Univ., 4. The Univ. Museum, The Univ. of Tokyo, 5. Natl. Inst. of Polar Res.

Keywords: silica, achondrites, phase transition, thermal history, tridymite

Assessment of Shock Melting of Martian Meteorites as Deduced from Short Time Heating Experiments of Basalt and Martian Soil Simulants

*Takeru Sato[1], Takashi Mikouchi[2]

1. Univ. of Tokyo, 2. Univ. of Tokyo

Keywords: Martian Meteorite, Shergottite, Heating Experiment, Regolith, Maskelynite

表 1 JSC Mars-1 を用いた加熱実験の結果

	10秒	30秒	1分	5分	10分	60分
1300度	△	○	○	-	-	◎
1200度	△	△	○	-	-	◎
1150度	△	△	△	○	○	○
1125度	△	△	△	-	-	○
1100度	-	-	-	-	-	△

◎：ほとんど(~90%)が溶融、○：少量(~10%)が溶融、△：わずかに(~5%)溶融

Observation of internal structure of diamond in carbon grains in DaG 999 ureilite.

*Masahiro YASUTAKE[1], Megumi Matsumoto[3], Junya Matsuno[2], Akira Tsuchiyama[2,4], Kentaro Uesugi[1], Akihisa Takeuchi[1]

1. JASRI, 2. Ritsumeikan Univ., 3. Tohoku Univ., 4. CAS/GIG

Keywords: SR-CT, mateorite, ureilite, diamond, graphite

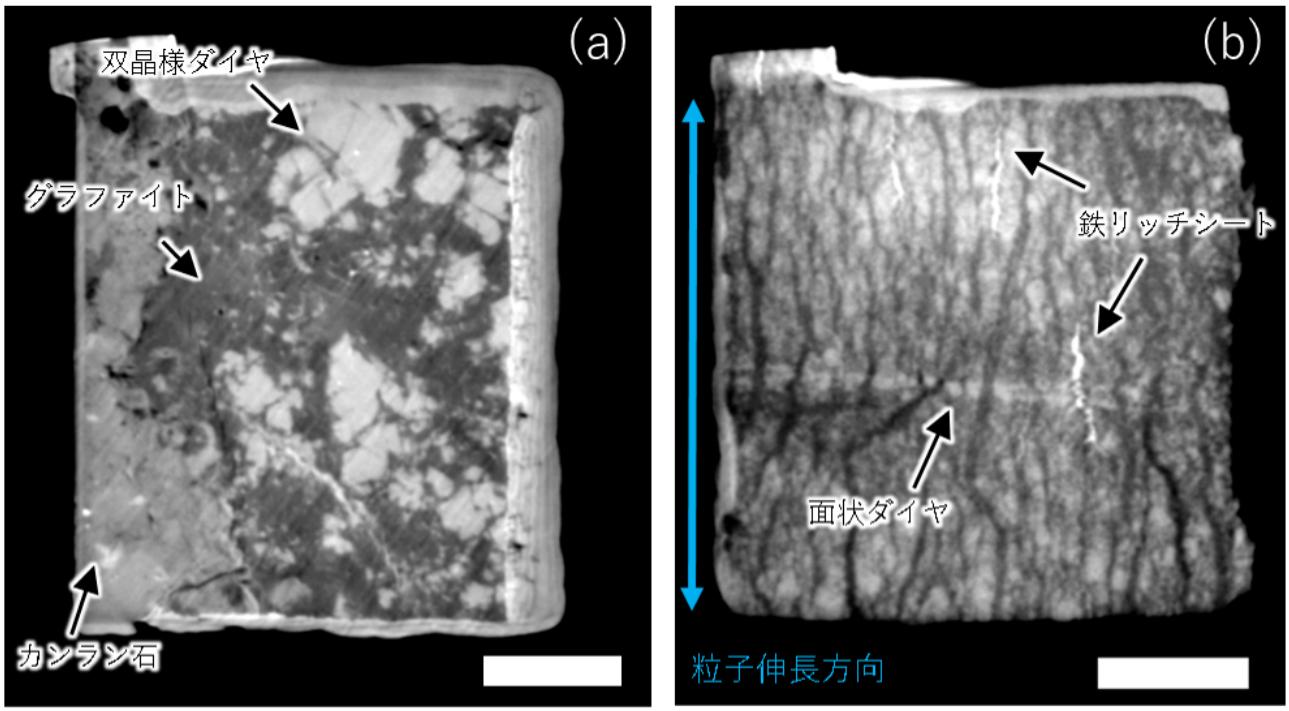


図1. 炭素粒子のCT断面像. （a）粒子2の位相像. グラファイト中にマイクロダイヤが囲まれるように産する. 図上部には双晶様に産するダイヤが見られる. （b）粒子3の位相像. 試料全体に粒子伸長方向（紙面上下）と平行な層構造が発達している。また、特徴的に鉄に富むシートが含まれる. 図中央には層構造とほぼ直行方向（紙面左右）に面状のダイヤと思われるものが分布する. この構造上下方向の層構造に切られている事が分かる. 図中スケールバーは10μm.

Oral presentation

R5: Extraterrestrial materials

Chairperson:Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Shogo Tahibana

Sat. Sep 16, 2023 9:00 AM - 12:00 PM 821 (Sugimoto Campus)

10:15 AM - 10:30 AM

[3Lecture-201-11-6add]休憩

Nano-CT and TEM analysis of impact melt splashes and microcraters on asteroid Ryugu samples

*Megumi MATSUMOTO[1], Junya Matsuno[2], Akira Tsuchiyama[2,3], Tomoki Nakamura[1], Yuma Enokido[1], Mizuha Kikuiri[1], Masahiro Yasutake[4], Kentaro Uesugi[4], Akihisa Takeuchi[4], Satomi Enju[5], Shota Okumura[6], Itaru Mitsukawa[6], Sun Mingqi[3], Akira Miyake[6], Hayabusa2 initial analysis core-team

1. Tohoku Univ., 2. Ritsumeikan Univ., 3. GIG, CAS, 4. JASRI, 5. Ehime Univ., 6. Kyoto Univ.

Keywords: asteroid (162173) Ryugu, micrometeoroid impact, impact melt splash

Origins of olivine grains in CI chondrites and asteroid Ryugu samples as inferred from their major and minor element compositions

*Takashi MIKOUCHI[1], Hideto Yoshida[1], Minami Masuda[1], Michael E. Zolensky[2]

1. Univ. of Tokyo, 2. NASA/JSC

Keywords: CI chondrite, Asteroid Ryugu, Olivine, Amoeboid olivine aggregat (AOA), Chondrule

On the relationship between modal abundances of minerals and degrees of aqueous alteration of the brecciated fragments in the Orgueil CI chondrite

*Minami Masuda[1], Takashi Mikouchi[2], Michael Zolensky[3]

1. UTokyo Sci., 2. UTokyo UMUT/Sci., 3. NASA JSC

Keywords: CI chondrite, Orgueil meteorite, modal abundance

	Org小1_01	Org小1_02	Org小1_03	Org小1_04	Org小2_01	Org小2_02	Org小2_03	Org小2_04	Org小2_05	Org小2_06
層状ケイ酸塩	96.32	95.43	93.82	93.90	94.10	95.53	94.44	99.11	96.50	92.62
マグネタイト	1.56	3.73	3.66	2.78	2.43	3.96	2.85	0.89	2.30	6.61
硫化鉄	1.69	0.07	0.14	0.13	0.15	0.26	0.05	—	—	0.12
ドロマイト	0.33	0.54	1.79	3.19	1.66	0.21	2.53	—	0.89	0.64
ブリューネライト	—	—	—	—	—	—	—	—	—	—
Ca炭酸塩	—	—	—	—	—	—	—	—	—	—
Caリン酸塩	0.10	0.21	0.59	0.00	1.66	0.04	0.14	—	0.31	0.01
カンラン石、輝石	—	0.03	—	—	—	—	—	—	—	—

Org小2_07	Org小2_08	Org小2_09	Org小3_01	Org小3_02	Org小3_03	Org小3_04	Org小3_05	Org小3_06	Org小3_07	Org小3_08
93.29	98.08	95.50	95.87	99.10	96.63	96.66	97.10	96.70	96.65	98.45
2.83	1.85	2.68	3.15	0.83	1.82	2.67	2.05	3.11	1.40	1.10
0.02	—	1.06	0.01	—	0.02	0.00	0.01	—	—	—
3.72	0.07	0.72	0.92	—	1.15	0.41	0.44	0.14	0.43	0.41
—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
0.13	—	0.04	0.04	—	0.39	0.26	0.40	0.05	—	—
—	—	—	0.01	0.07	—	—	—	—	1.52	0.04

Org大_00	Org大_01	Org大_04	Org大_17	Org大_18	Org大_21	Org大_26	Org大_30	Org大_31	Org大_33	Org大_35	Org大_36
92.96	95.37	91.43	94.44	90.34	90.06	94.93	96.16	93.12	92.56	92.79	92.74
6.76	4.63	7.49	5.02	7.82	9.04	4.48	3.44	6.26	6.46	6.56	6.69
0.04	—	—	—	—	0.05	0.59	0.45	0.46	—	0.33	0.31
0.28	—	1.08	0.55	1.84	0.90	0.59	0.40	0.62	0.98	0.66	0.58
—	—	—	—	—	—	—	—	—	—	—	—
0.05	—	—	—	—	—	—	—	—	0.06	—	—
—	—	—	—	—	—	—	0.04	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—

表 1

Mineralogical diversity of the C1 lithologies in the Kaidun meteorite

*Kenei OGIYA[1], Takashi Mikouchi[2], Michael E Zolensky[3]

1. Univ. of Tokyo, 2. Univ. of Tokyo , 3. NASA

Keywords: Carbonaceous chondrite, Aqueous alteration, Petrological type 1, Carbonate minerals, Iron sulfides

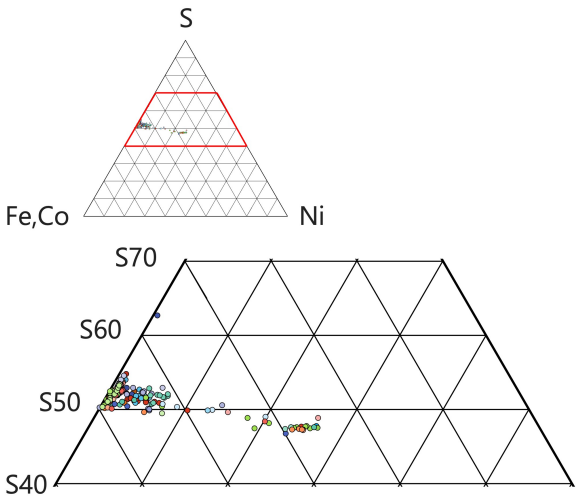


図1
38個のKaidun C1岩片における鉄硫化物組成

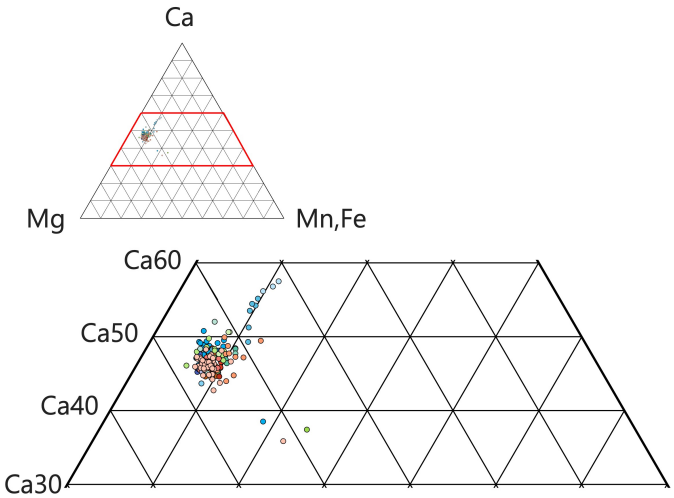


図 2
21個のKaidun C1岩片におけるdolomite組成

Classification of subtype 3.0 chondrites

*Makoto Kimura[1], Michale K. Weisberg[2], Akira Yamaguchi[1]

1. National Institute of Polar Rsearch, 2. City University of New York

Type 3 chondrites are subdivided into 3.0 to 3.9. Subtype 3.0 chondrites nearly preserve all of their primitive features. Many criteria have been proposed to distinguish such primitive chondrites. Here we compiled mineral data and reconsider the classification criteria for subtype 3.0.

Keywords: Chondrite, Classification

Oral presentation

R5: Extraterrestrial materials

Chairperson:Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Shogo Tahibana

Sat. Sep 16, 2023 9:00 AM - 12:00 PM 821 (Sugimoto Campus)

[zoom]Zoom

Zoom

Oral presentation | R3: High-pressure science and deep Earth's material

Sat. Sep 16, 2023 9:00 AM - 12:00 PM JST | Sat. Sep 16, 2023 12:00 AM - 3:00 AM UTC | 822 Sugimoto Campus

R3: High-pressure science and deep Earth's material

Chairperson:Takaaki Kawazoe(Hiroshima University), Takeshi Sakai(Ehime University), Masayuki Nishi(Osaka University)

9:00 AM - 9:15 AM JST | 12:00 AM - 12:15 AM UTC

[R3-01] First-principles investigations of the polysomatism of antigorite under pressure

*Jun TSUCHIYA[1], Sayako Inoue[1], Taiga Mizoguchi[1] (1. Ehime University)

9:15 AM - 9:30 AM JST | 12:15 AM - 12:30 AM UTC

[R3-02] The change in the hydrous mechanism of enstatite with Al incorporation

*Moe Sakurai[1], Hiroshi Sakuma[2], Noriyoshi Tsujino[3], Eiichi Takahashi[4], Katsuyuki Kawamura[5] (1. Okayama Univ., 2. NIMS, 3. JASRI, 4. GIG, CAS, 5. Tokyo Tech.)

9:30 AM - 9:45 AM JST | 12:30 AM - 12:45 AM UTC

[R3-03] H and Al incorporation mechanisms in stishovite: New insights from multi-nuclear NMR and first-principles calculation

*Xianyu XUE[1], Masami Kanzaki[1] (1. Okayama University)

9:45 AM - 10:00 AM JST | 12:45 AM - 1:00 AM UTC

[R3-04] Influence of high oxygen fugacity on melting temperature of wadsleyite and chemical composition of the generated melts

[Presentation award entry]

*Kazutaka YAMAGUCHI[1], Takaaki Kawazoe[1], Toru Inoue[1], Takeshi Sakai[2] (1. Hiroshima Univ. Adv, 2. Ehime Univ. Geodynamics)

10:00 AM - 10:15 AM JST | 1:00 AM - 1:15 AM UTC

[R3-05] Anoisotropic electrical resistivity in $FeTiO_3$ ilmenite, compressibility and spin state under high pressure.

*Takamitsu YAMANAKA[1] (1. Chinese HPSTAR)

10:15 AM - 10:30 AM JST | 1:15 AM - 1:30 AM UTC

[R3-06] Melting relations at the mantle transition zone to uppermost lower mantle in the MgO-SiO_2-H_2O system

*Toru INOUE[1], Kota OKUMURA[1], Takaaki KAWAZOE[1], Sho KAKIZAWA[2], Masamichi NODA[3], Tetsuo IRIFUNE[4], Toru SHINMEI[4] (1. Hiroshima Univ.y, 2. JASRI, 3. Delaware State Univ., 4. Ehime Univ. GRC)

10:30 AM - 10:45 AM JST | 1:30 AM - 1:45 AM UTC

[3Lecture-301-11-7add] 休憩

10:45 AM - 11:00 AM JST | 1:45 AM - 2:00 AM UTC

[R3-07] **Water content profile of magma in the mantle transition zone predicted from high-pressure, high-temperature experiments**

[Presentation award entry]

*Yusuke Egi[1], Toru Inoue[1], Kota Okumura[1], Takaaki Kawazoe[1] (1. Hiroshima Univ. Sci.)

11:00 AM - 11:15 AM JST | 2:00 AM - 2:15 AM UTC

[R3-08] Elastic anomaly at the spin transition in ferropericlase: Revisited by GHz-DAC Ultrasonic Velocity Measurement newly developed

*Takuto Kato[1], Akira Yoneda[1], Tadashi Kondo[1], Daisuke Yamazaki[2] (1. Osaka Univ. Sci., 2. Okayama. IPM)

11:15 AM - 11:30 AM JST | 2:15 AM - 2:30 AM UTC

[R3-09] Iron-Water Exchange at the Earth's Core-Mantle Boundary

[Presentation award entry]

*Katsutoshi Kawano[1], Masayuki Nishi[1], Sho Kakizawa[2], Toru Inoue[3], Hideharu Kuwahara[4], Tadashi Kondo[1] (1. Osaka Univ. Sci, 2. JASRI, 3. Hiroshima Univ. Sci, 4. Ehime Univ. GRC)

11:30 AM - 11:45 AM JST | 2:30 AM - 2:45 AM UTC

[R3-10] Increase of hydrogen-induced volume expansion by incorporation of Si into iron and the effect in estimated hydrogen content in the Earth’s core

[Presentation award entry]

*Yuichiro MORI[1], Hiroyuki Kagi[1], Katsutoshi Aoki[1], Masahiro Takano[1], Sho Kakizawa[2], Asami Sano[3], Ken-ichi Funakshi[4] (1. UTokyo, 2. JASRI, 3. J-PARC Center, JAEA, 4. CROSS)

11:45 AM - 12:00 PM JST | 2:45 AM - 3:00 AM UTC

[R3-11] Post-spinel transition of Fe_2SiO_4 ahrensite at high pressure and high temperature

*Masaki AKAOGI[1,2], Natsuki MIYAZAKI[1], Taisuke TAJIMA[1], Hiroshi KOJITANI[1] (1. Gakushuin Univ. Sci. , 2. Univ. Tokyo Sci.)

[zoom] Zoom

First-principles investigations of the polysomatism of antigorite under pressure

*Jun TSUCHIYA[1], Sayako Inoue[1], Taiga Mizoguchi[1]

1. Ehime University

Serpentine is hydrous phyllosilicate known to be formed in the mantle wedge by a reaction between mantle peridotie and upwelling water released by the decomposition of hydrous minerals in the subducting slab [e.g. Schmidt and Poli,1998]. Partially serpentinized peridotite may be a significant reservoir of water in the mantle wedge and the dehydration of serpentine is considered to have an important contribution to the generation of arc magmatism. This was also extensively investigated in connection with intermediate and deep earthquakes [e.g. Irifune et al. , 1996].
In order to investigate the transporting processes of water into the Earth’ s interior, the thermodynamic stabilities and the elastic properties of antigorite should be clarified. Antigorite is the high-temperature polymorph of serpentine and thus the relevant phase in the subduction zone. This phase has been reported to show polysomatism depending on the pressure and temperature conditions. Previous TEM study reported that *m* value (*m* = number of SiO_4 tetrahedra in a wavelength along the a axis) increases/decreases with pressure/temperature [e.g. Wunder et al. 2001]. However, there is no sufficient structural and thermodynamic corroboration regarding the stable polysome of antigorite along the pressure and temperature conditions of the subducting oceanic plate.
In the present study, we investigated the structure and elasticity of antigorite with several different *m* values by ab intio calculation and discuss the stable polysome of antigorite in the subducting oceanic plate.

Keywords: ab initio calculation, antigorite

The change in the hydrous mechanism of enstatite with Al incorporation

*Moe Sakurai[1], Hiroshi Sakuma[2], Noriyoshi Tsujino[3], Eiichi Takahashi[4], Katsuyuki Kawamura[5]

1. Okayama Univ., 2. NIMS, 3. JASRI, 4. GIG, CAS, 5. Tokyo Tech.

Keywords: Hydrous mechanism, DFT calculation, FT-IR

H and Al incorporation mechanisms in stishovite: New insights from multi-nuclear NMR and first-principles calculation

*Xianyu XUE[1], Masami Kanzaki[1]

1. Okayama University

Aluminous stishovite has been recognized as an important water carrier in subducted oceanic basalts, and may be responsible for some observed seismic anomalies. In order to constrain how the incorporation of H and Al in stishovite affects its physical properties, it is important to understand how these elements are incorporated in the crystal structure. Previous studies generally reported that the H/Al ratios in stishovite are significantly below unity, requiring both coupled Al+H substitution for Si and excess Al accompanied by oxygen vacancies. However, there have been little direct supporting evidences for the proposed substitution mechanisms. In this study, we performed a comprehensive ^{1}H MAS and static NMR, ^{27}Al MAS and 3QMAS NMR, ^{1}H-^{29}Si and ^{1}H-^{27}Si CPMAS NMR study on a hydrous aluminous stishovite sample, which was first described in Xue et al. (2006) Am Mineral 91, 850-861, and synthesized from a nominal bulk composition of 0.95SiO_2.0.05AlOOH at 18 GPa and 1800˚C. NMR measurements were made using a Bruker Avance NEO 400 spectrometer. We also performed first-principles calculation with the GIPAW method using the Quantum-ESPRESSO package (v.7.0) on various optimized model structures containing coupled Al+H substitution for Si and substitution of 2Al+1O vacancy for 2Si to help interpretation. It was found that the sample consists of a hydrous aluminous stishovite phase containing about 0.3 wt% H2O, coexisting with Al_2O_3 corundum. The stishovite phase yields a ^{1}H MAS NMR peak near 9.4 ppm, a ^{1}H-^{29}Si CPMAS NMR peak near -191 ppm with a weak shoulder toward less negative chemical shift, attributable to octahedral Si, and a ^{1}H-^{27}Al CPMAS NMR peak with a maximum near 1.9 ppm, attributable to octahedral Al. The main features of all the observed NMR spectra are consistent with first-principles calculation results for coupled Al-H substitution for Si. No four- or five- coordinated Si or Al, which should occur if the substitution mechanism of 2Al+O vacancy for 2Si operates, were revealed, although expected to be observable (e.g., calculated C_Q^{Al} around 6.0~9.4 MHz for Al^{V}). This study thus casted doubt on the general validity of views held thus far about H and Al incorporation mechanisms in stishovite. Raman and EPMA analyses are also under planning, and the latest results will be presented at the meeting.

Keywords: water, stishovite, NMR, first-principles calcualtion, aluminum

Influence of high oxygen fugacity on melting temperature of wadsleyite and chemical composition of the generated melts

*Kazutaka YAMAGUCHI[1], Takaaki Kawazoe[1], Toru Inoue[1], Takeshi Sakai[2]

1. Hiroshima Univ. Adv, 2. Ehime Univ. Geodynamics

Keywords: Wadsleyite, Ferric iron, Oxygen fugacity, Melting temperature, Mantle transition zone

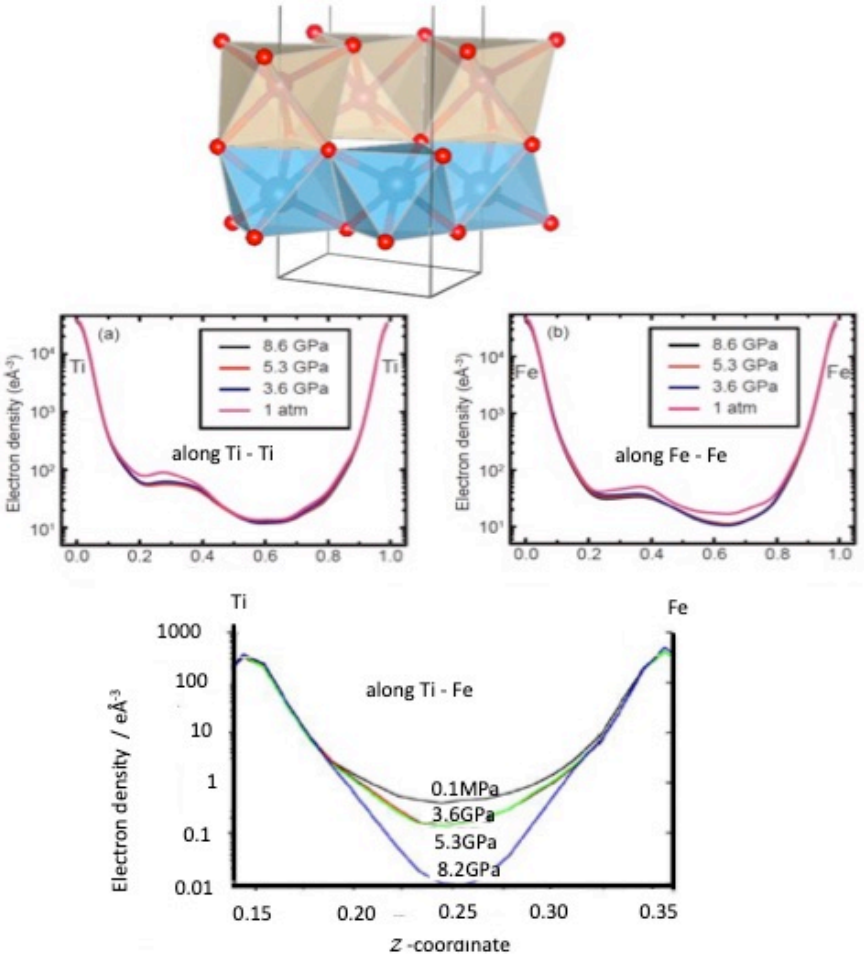
Anoisotropic electrical resistivity in $FeTiO_3$ ilmenite, compressibility and spin state under high pressure.

*Takamitsu YAMANAKA[1]

1. Chinese HPSTAR

Neutron and synchrotron X-ray diffraction experiments perform precise analysis of the $FeTiO_3$ ilmenite structure. $FeTiO_3$does neither transform into perovskite nor $LiNbO_3$ structure phase under pressures up to 28 GPa. However, different compression curves of both FeO_6 and TiO_6 octahedra are observed below 8 GPa. FeO_6 is more compressive and flexible than TiO_6. TiO_6 octahedron is an extremely rigid body. Pressure dependence of electrical resistivity using single crystal proves that $FeTiO_3$ ilmenite shows an anisotropic electrical conductivity. The resistivity in the direction perpendicular to the *c*-axis decreases monotonously with increasing pressure. On the other hand the resistivity parallel to the *c*-axis shows the hallow-shape of the curvature. In three Fe-Fe, Ti-Ti and Fe-Ti atomic distances, the shortest Fe-Ti distance presents the highest electrical conduction and electron mobility of $Fe^{2+}Ti^{4+}$ and $Fe^{3+}Ti^{3+}$ by electron super exchange during compression between adjacent Fe and Ti cations.The electron localization around Fe and Ti atoms is clarified by maximum entropy measurement calculation. Electron configuration of Fe^{2+} ($3d^6$) is more strongly changed than Ti^{4+} ($3d^0$) under compression. The electron configuration of the former cation is related to the revolution of Jahn-Teller effect in the ligand field of C_{3v} molecular symmetry. The anisotropic electrical conductivity and non-uniform structure change of Fe-Ti interatomic distance can be explained by the possible spin transition. The spin transition of Fe*Kb* from high-spin state to intermediate-spin state is possible in the electronic state change of $FeTiO_3$.

Keywords: FeTiO3 ilmenita, high-pressure neutron diffraction, electrical resistivity measurement, anisotropic electron super exchange, electron radial distribution


(a)
8.6 GPa
5.3 GPa
3.6 GPa
1 atm
Ti
Ti
along Ti - Ti
Electron density (eÅ-3)
(b)
Fe
Fe
along Fe - Fe
Ti
Fe
along Ti - Fe
0.1MPa
3.6GPa
5.3GPa
8.2GPa
Electron density / eÅ-3
Z -coordinate

Melting relations at the mantle transition zone to uppermost lower mantle in the MgO-SiO_2-H_2O system

*Toru INOUE[1], Kota OKUMURA[1], Takaaki KAWAZOE[1], Sho KAKIZAWA[2], Masamichi NODA[3], Tetsuo IRIFUNE[4], Toru SHINMEI[4]

1. Hiroshima Univ.y, 2. JASRI, 3. Delaware State Univ., 4. Ehime Univ. GRC

Keywords: MgO-SiO2-H2O system, Melting relations, mantle transition zone, lower mantle , hydrous magma

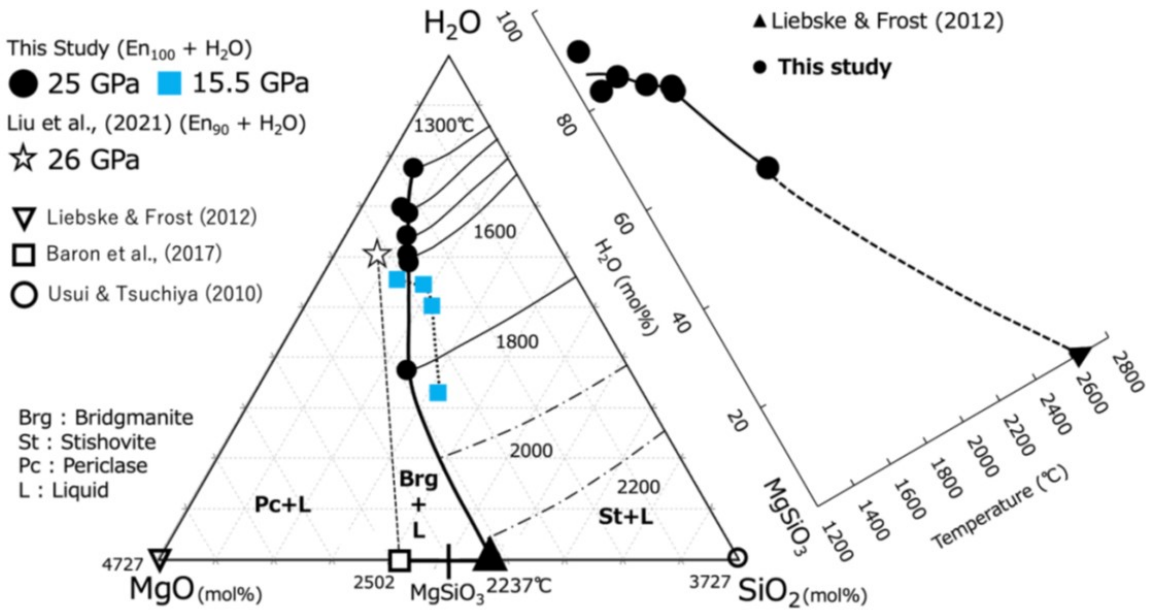


図 1. MgO-SiO_2-H_2O 系における共融線（15.5 GPa (点線) , 25 GPa (太線) 。細線は等温線。（Brg : Bridgmanite , St : Stishovite , Pc : Periclase , L : Liquid）

Oral presentation

R3: High-pressure science and deep Earth’ s material

Chairperson:Takaaki Kawazoe(Hiroshima University), Takeshi Sakai(Ehime University), Masayuki Nishi(Osaka University)

Sat. Sep 16, 2023 9:00 AM - 12:00 PM 822 (Sugimoto Campus)

10:30 AM - 10:45 AM

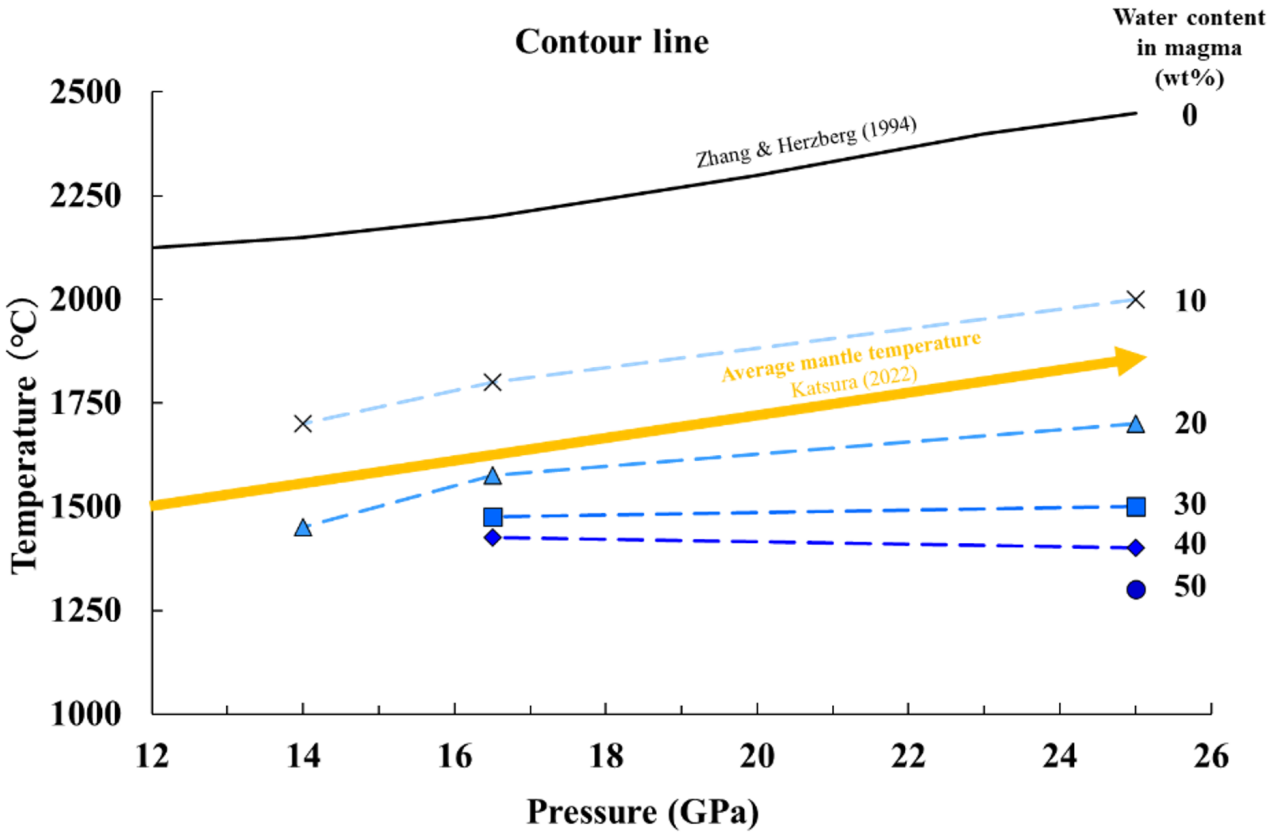
[3Lecture-301-11-7add]休憩

Water content profile of magma in the mantle transition zone predicted from high-pressure, high-temperature experiments

*Yusuke Egi[1], Toru Inoue[1], Kota Okumura[1], Takaaki Kawazoe[1]

1. Hiroshima Univ. Sci.

Keywords: Water content in magma



図：各温度圧力で生成する含水マグマの等含水量線↵

Elastic anomaly at the spin transition in ferropericlase: Revisited by GHz-DAC Ultrasonic Velocity Measurement newly developed

*Takuto Kato[1], Akira Yoneda[1], Tadashi Kondo[1], Daisuke Yamazaki[2]

1. Osaka Univ. Sci., 2. Okayama. IPM

Keywords: Ferropericlase, Spin transition, GHz method, Diamond Anvil Cell

Iron-Water Exchange at the Earth's Core-Mantle Boundary

*Katsutoshi Kawano[1], Masayuki Nishi[1], Sho Kakizawa[2], Toru Inoue[3], Hideharu Kuwahara[4], Tadashi Kondo[1]

1. Osaka Univ. Sci, 2. JASRI, 3. Hiroshima Univ. Sci, 4. Ehime Univ. GRC

Keywords: ultralow velocity zones, multi-anvil apparatus experiment, bridgmanite, ferropericlase, water

Increase of hydrogen-induced volume expansion by incorporation of Si into iron and the effect in estimated hydrogen content in the Earth’ s core

*Yuichiro MORI[1], Hiroyuki Kagi[1], Katsutoshi Aoki[1], Masahiro Takano[1], Sho Kakizawa[2], Asami Sano[3], Ken-ichi Funakshi[4]

1. UTokyo, 2. JASRI, 3. J-PARC Center, JAEA, 4. CROSS

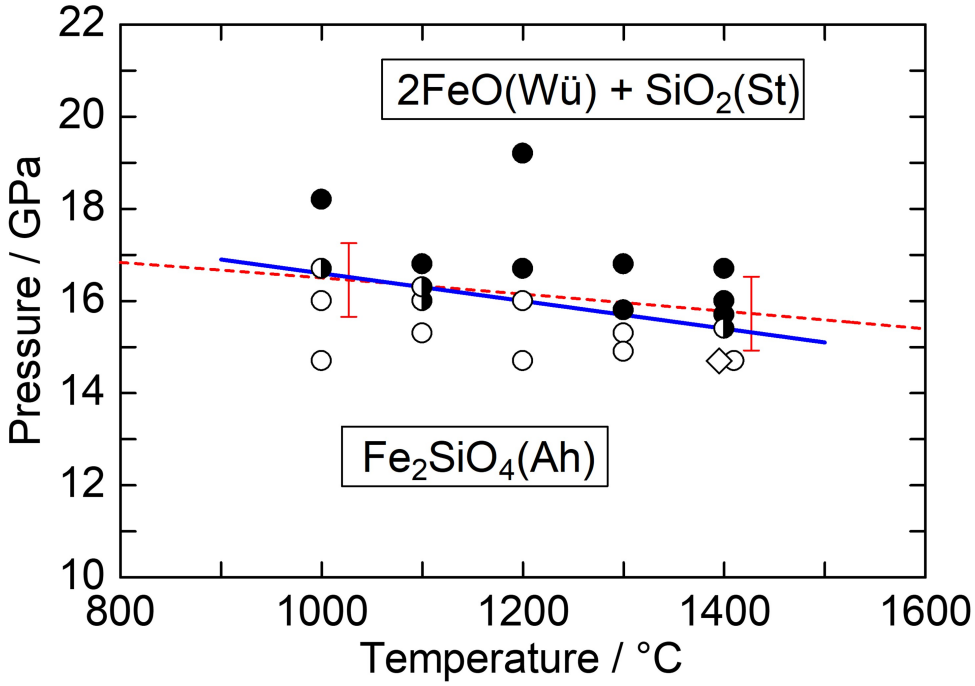
Keywords: High-pressure experiments, Neutron diffraction, Light element in the core, Hydrogen, Silicon

Post-spinel transition of Fe_2SiO_4 ahrensite at high pressure and high temperature

*Masaki AKAOGI[1,2], Natsuki MIYAZAKI[1], Taisuke TAJIMA[1], Hiroshi KOJITANI[1]

1. Gakushuin Univ. Sci. , 2. Univ. Tokyo Sci.

Keywords: Post-spinel transition , ahrensite, high-pressure experiment, thermodynamic calculation



Oral presentation

R3: High-pressure science and deep Earth’ s material

Chairperson:Takaaki Kawazoe(Hiroshima University), Takeshi Sakai(Ehime University), Masayuki Nishi(Osaka University)

Sat. Sep 16, 2023 9:00 AM - 12:00 PM 822 (Sugimoto Campus)

[zoom]Zoom

Zoom

Oral presentation | R6: Plutonic rocks, volcanic rocks and subduction factory

Sat. Sep 16, 2023 10:15 AM - 12:00 PM JST | Sat. Sep 16, 2023 1:15 AM - 3:00 AM UTC | 820 Sugimoto Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson:Takashi Yuguchi, Atsushi Kamei

10:15 AM - 10:30 AM JST | 1:15 AM - 1:30 AM UTC

[R6-01] Igneous activity formed meta-granitoid in the Tenmondai rocks of the Lützow-Holm complex, East Antarctica

*Atsushi KAMEI[1], Momo Ichikawa[1], Tomokazu Hokada[2], Kenichiro Tani[3], Ippei Kitano[4], Sotaro Baba[5], Nugroho I. Setiawan[6], Prayath Nantasin[7], Davaa-ochir Dashbaatar[8], Yoichi Motoyoshi[2] (1. Shimane University, 2. National Institute of Polar Research, 3. National Museum of Nature and Science, 4. Hokkaido University, 5. University of the Ryukyus, 6. Universitas Gadjah Mada, 7. Kasetsart University, 8. Mongolian University of Science and Technology)

10:30 AM - 10:45 AM JST | 1:30 AM - 1:45 AM UTC

[R6-02] Mafic veins in the mantle section recovered during Oman Drilling Project: products of backarc spreading?

*Yuji ICHIYAMA[1], Hisatoshi Ito[2], Akihiro Tamura[3], Tomoaki Morishita[3] (1. Chiba University, 2. Central Research Institute of ElectricPower Industry, 3. Kanazawa University)

10:45 AM - 11:00 AM JST | 1:45 AM - 2:00 AM UTC

[R6-03] Muographic study of the oceanic crust-mantle density structure of the Oman Ophiolite

*Susumu UMINO[1], Hiroyuki Tanaka[2], László Oláh[2], Dezső Varga[4], Tomoaki Morishita[1], Yoshihiro Hiramatsu[1], Yuki Kusano[3] (1. Kanazawa University, 2. University of Tokyo, 3. AIST, 4. Wigner Research Center for Physics)

11:00 AM - 11:15 AM JST | 2:00 AM - 2:15 AM UTC

[R6-04] Magma genesis of the Iwafune diorites, Ibaraki Prefecture

[Presentation award entry]

*Haruki YAMAZAKI[1,2], Terumi EJIMA[1,2], Yoshiaki KON[2] (1. Shinshu Univ. Sci., 2. GSJ, AIST)

11:15 AM - 11:30 AM JST | 2:15 AM - 2:30 AM UTC

[R6-05] Zircon U-Pb age combined with trace element geochemistry constraining the source of Miocene granitoids of the Kagoshima Prefecture, Japan

*Hafiz Ur REHMAN[1], Marimo NAKABAYASHI[1], Yuki OTA[1], Kaushik DAS[2], Chung Sun LIN[3], Hao YANG LEE[3], Daisuke YAMASHITA[4], Hiroshi YAMAMOTO[1] (1. Kagoshima Uni., 2. Hiroshima Uni., 3. IES, Academia Sinica, Taiwan, 4. Satsumasendai Kosh. Mus.)

11:30 AM - 11:45 AM JST | 2:30 AM - 2:45 AM UTC

[R6-06] Chronological re-examination of the Kanmon Group, Southwest Japan: and remaining unsolved problems

*Yukiyasu TSUTSUMI[1], Ryo Hasegawa[2], Yukio Isozaki[3] (1. National Museum of Nature and Science, 2. FUJIFILM Business Innovation Corp., 3. Graduate school of Arts and Sciences, University of Tokyo)

11:45 AM - 12:00 PM JST | 2:45 AM - 3:00 AM UTC

[R6-07] U-Pb zircon age of granitoids in the Aoyama area, Ryoke belt, SW Japan

*Fumiko HIGASHINO[1], Tetsuo KAWAKAMI[1], Shuhei SAKATA[2], Shunpei Kudo[1], Yohei IGAMI[1] (1. Kyoto Univ. Sci., 2. Univ. Tokyo)

[zoom] Zoom

Igneous activity formed meta-granitoid in the Tenmondai rocks of the Lützow-Holm complex, East Antarctica

*Atsushi KAMEI[1], Momo Ichikawa[1], Tomokazu Hokada[2], Kenichiro Tani[3], Ippei Kitano[4], Sotaro Baba[5], Nugroho I. Setiawan[6], Prayath Nantasin[7], Davaa-ochir Dashbaatar[8], Yoichi Motoyoshi[2]

1. Shimane University, 2. National Institute of Polar Research, 3. National Museum of Nature and Science, 4. Hokkaido University, 5. University of the Ryukyus, 6. Universitas Gadjah Mada, 7. Kasetsart University, 8. Mongolian University of Science and Technology

Keywords: Meta-granitoid, Tenmondai rocks, Lützow-Holm complex, East Antarctica

Mafic veins in the mantle section recovered during Oman Drilling Project: products of backarc spreading?

*Yuji ICHIYAMA[1], Hisatoshi Ito[2], Akihiro Tamura[3], Tomoaki Morishita[3]

1. Chiba University, 2. Central Research Institute of ElectricPower Industry, 3. Kanazawa University

Keywords: Oman ophiolite, Oman Drilling Project, Mafic veins, Backarc spreading

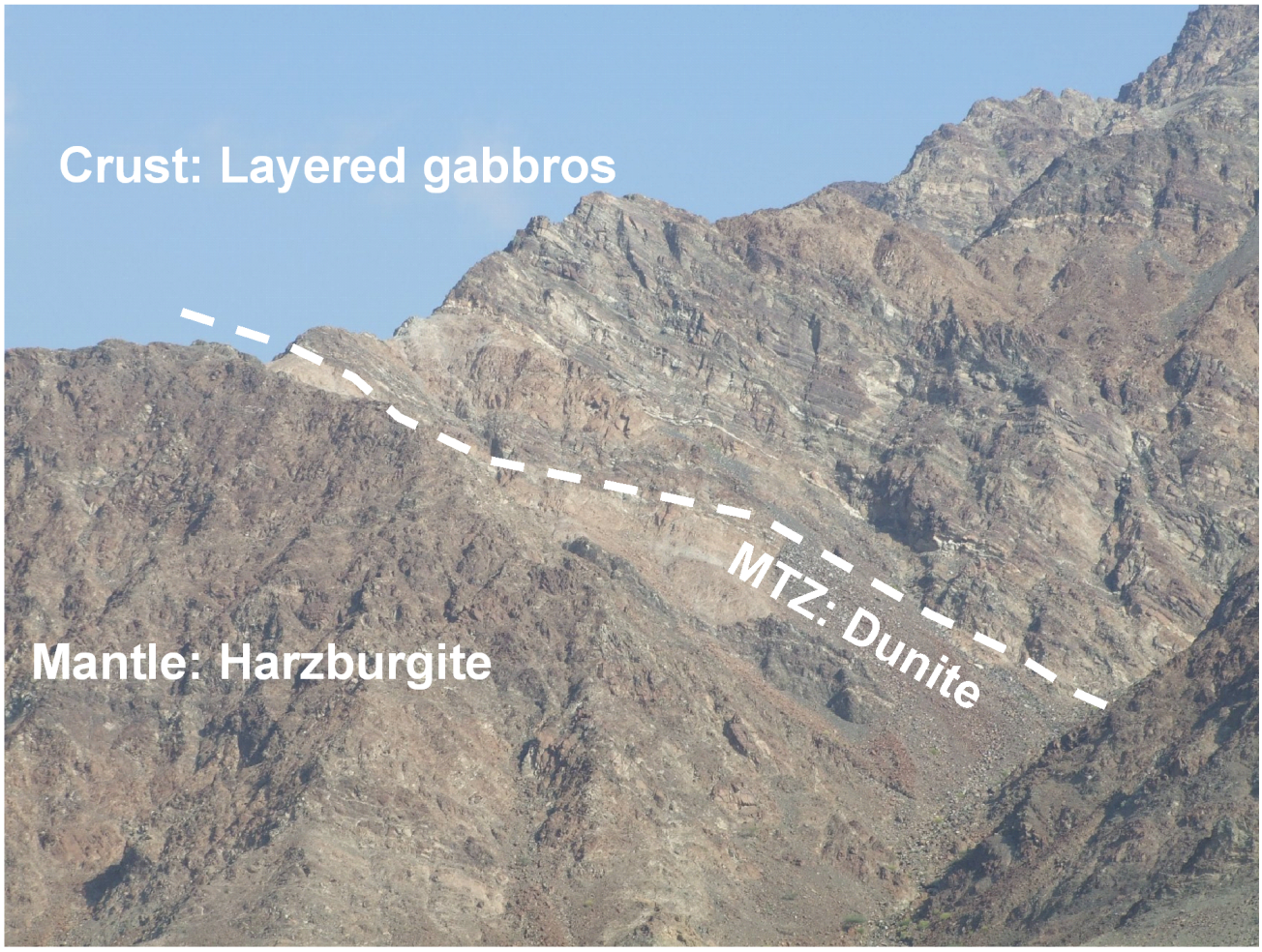
Muographic study of the oceanic crust-mantle density structure of the Oman Ophiolite

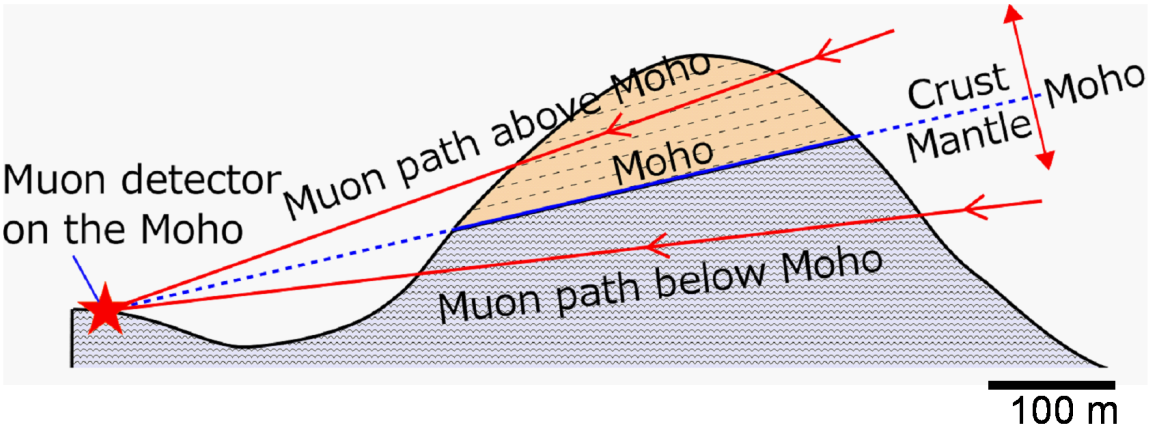
*Susumu UMINO[1], Hiroyuki Tanaka[2], László Oláh[2], Dezső Varga[4], Tomoaki Morishita[1], Yoshihiro Hiramatsu[1], Yuki Kusano[3]

1. Kanazawa University, 2. University of Tokyo, 3. AIST, 4. Wigner Research Center for Physics

The oceanic lithosphere is divided into crust (layers 1-3) and mantle (layer 4) according to seismic wave reflection surfaces and velocity structures. The Layer 1-2 boundary corresponds to the boundary between sediment and basement rock. On the other hand, the Layer 2-3 boundary (upper-lower crustal boundary) and the Layer 3-4 boundary (Moho) are not well understood due to difficulties in observation and lack of basic understanding of geology and lithology. The Layer 2, 3, and 4 have been correlated with the extrusive rocks and sheeted dikes, gabbros, and peridotites, respectively, based on comparison with ophiolite geology. However, in Hole 504B, the only deep-sea drilling that penetrated the Layer 2-3 boundary, the boundary is located in the middle of the sheeted dike complex, which is attributed to alteration and reduced porosity[a]. Hole 1256D penetrated into the gabbros, however, the Layer 2-3 boundary has not been reached yet[b]. The drilling through the Moho and into the mantle is the flagship research project of the next IODP and the most important target of the Project Mohole, but it has not yet been accomplished. Therefore, comparative study of ophiolites is the only clue to understanding the relationships between seismic velocity structure and geology. In particular, the Oman ophiolite, the largest and best preserved in the world, has been intensely studied as an analogue of the fast spread crust and mantle. Kanazawa University, the University of Tokyo, Wigner Research Center for Physics in Hungary, and the Ministry of Energy and Minerals of the Sultanate of Oman are collaborating in an international joint project to image the lithologic boundaries of the Oman Ophiolite, corresponding to the crust-mantle boundary, upper-lower crust boundary, and layer 2A-2B boundary, on the scale of 100 m to km, which can be directly compared with the seismic structure. This presentation will give an overview of the project and the results of preliminary investigations.

Keywords: Muography, Oman Ophiolite, Oceanic crust - Mantle, Moho transition zone, density structure





Muon detectors installed on the Moho acquire muon signals passing through the target.

Magma genesis of the Iwafune diorites, Ibaraki Prefecture

*Haruki YAMAZAKI[1,2], Terumi EJIMA[1,2], Yoshiaki KON[2]

1. Shinshu Univ. Sci., 2. GSJ, AIST

It is important to reveal the magma genesis of plutonic rocks in Southwest Japan during Late Cretaceous to Paleogene to understand crustal growth in Japan because large amounts of plutonic rocks were formed in this age. However, the magma genesis of diorite in eastern Southwest Japan has not been reported. Because of its large surface exposure area, the Iwafune diorite represents diorite in this region. Therefore, we reveal the primitive melt genesis of the Iwafune diorite to understand magma genesis in this region.
The Iwafune pluton consists of diorite, orthopyroxene (opx) diorite, and granite. The opx diorites are lower SiO2 contents and higher enstatite contents of pyroxene than the diorite. The compositional variation of the Iwafune diorite can be explained by the fractional crystallization of clinopyroxene and plagioclase from the opx diorite (Yamazaki et al., 2023). Therefore, the opx diorite composition is the closest to the primitive melt composition of the Iwafune diorite.
In order to consider the genesis of the primitive melt of the Iwafune diorite, the Sr isotopic ratios of the upper mantle were estimated to be SrI of the gabbro in the Tsukuba Mountains (Arakawa and Takahashi, 1989; Shibata and Ishihara, 1979). The Sr isotopic ratios of the lower crust were estimated to be the SrI of the granites in this area (Arakawa and Takahashi, 1989; Shibata and Ishihara, 1979). The SrI of the Iwafune diorite (Shibata and Takagi, 1989) is different from the Sr isotopic ratios of the upper mantle, but it is equal to the Sr isotopic ratios of the lower crust. These results suggest that the primitive melt of the Iwafune diorite was formed by partial melting of the lower crust.
We examined whether partial melting of the lower crust would form the primitive melt composition of the Iwafune diorite. Because the HREE contents of the opx diorites are not depleted, and the temperature of the lower crust is 500-700℃ (Coinde, 2005), we estimate that the lower crust was not saturated with water at about 0.8 GPa when the Iwafune diorite formed. The composition of the melt, which is formed by the partial melting of basalt under these physical conditions (Rapp and Watson, 1995), is nearly equal to the composition of the opx diorite.
Therefore, we conclude that the primitive melt of the Iwafune diorite was most likely formed by partial melting of the lower crust.

Keywords: Diorite, Magma genesis, Iwafune pluton, Tsukuba Mountains

Zircon U-Pb age combined with trace element geochemistry constraining the source of Miocene granitoids of the Kagoshima Prefecture, Japan

*Hafiz Ur REHMAN[1], Marimo NAKABAYASHI[1], Yuki OTA[1], Kaushik DAS[2], Chung Sun LIN[3], Hao YANG LEE[3], Daisuke YAMASHITA[4], Hiroshi YAMAMOTO[1]

1. Kagoshima Uni., 2. Hiroshima Uni., 3. IES, Academia Sinica, Taiwan, 4. Satsumasendai Kosh. Mus.

This study reports zircon U-Pb age and trace element geochemistry of the Miocene granitoids exposed in Kagoshima to constrain their magmatic source. More than 150 zircon grains were U-Pb age-dated along with trace element contents from four plutons (#1. Osumi, #2. Takakuma Yama, #3. Shibi san, and #4. Koshikishima). Zircon grains from Osumi yielded U-Pb age values in the range from 13.4 ~ 15.8 Ma in sample OsG-3, 13.9 ~ 16.8 Ma in OsG-9, 13.3 ~ 14.7 in OsG-12, 14.2 ~ 16.4 in OsG-36. Zircons from Takakuma Yama yielded ages of 12.7 ~ 15.2 Ma from TkG-1 and 12.8 ~ 15.9 Ma in TkG-2. Shibi Pluton yielded ages of 12.7 ~ 14.3 Ma and a hornfels sample (Shb-19) yielded U-Pb age scattered between 13.9 and 206 Ma, with three spots giving values of 1803 Ma, 1873 Ma, and 2194 Ma from the detrital core domains. Zircons separated from Koshikishima Island yielded relatively younger age of 9 ~ 12 Ma in Kos-2, 8.8 ~ 12.1 Ma in Kos-11, 7.8 ~ 10.4 Ma in Kos-19, 8.7 ~ 10.6 Ma in Kos-30, 9.3 ~ 11.4 Ma in Kos-35, and 9.4 ~ 12.3 Ma in Kos-42. Trace element data of zircons, particularly, rare-earth elements, show typical magmatic type patterns with pronounced positive Ce and negative Eu anomalies. Ti-in-zircon thermometry data revealed temperature of crystallization ranging from 609 ~ 895 ℃, with majority of grains showing fall within 650 to 780 ℃ range. Age-data from plutons #1~3 are more or less identical and suggest Miocene magmatism possibly due to the trench-parallel ridge subduction that triggered partial melting in the overlying continental crust. Proterozoic cores suggest incorporation of the recycled crust during the magma formation. Pluton #4, yielding relatively younger age, may have resulted from partial melting of crust enriched in mafic component. Zircon trace element data, along with whole-rock major and trace element contents, also indicate the involvement of mafic component to generate the Koshikishima granitoids in a different tectonic scenario than the others.

Keywords: Zircon, U-Pb age, Miocene, Kagoshima Prefecture, Koshikishima

Chronological re-examination of the Kanmon Group, Southwest Japan: and remaining unsolved problems

*Yukiyasu TSUTSUMI[1], Ryo Hasegawa[2], Yukio Isozaki[3]

1. National Museum of Nature and Science, 2. FUJIFILM Business Innovation Corp., 3. Graduate school of Arts and Sciences, University of Tokyo

Stratigraphic studies were capable in fore arc sediments because they consist mainly of marine sediments which contain index fossils and radiolarian fossils. Whereas intra- and back-arc sediments which consist of terrestrial sediments had no other choice than to correlate fresh-water fauna and/or apply radiometric ages which have low reliability. After decades of developments, zircon U-Pb age method expand application. It is applied not only to clarify eruption/deposition age of tuff beds but also age limitation and provenance studies of clastic rocks.
The Kanmon Group is the one of the intra-arc sediments. Although detrital zircon dating is also applied, it is not statistically significant because of too small number of analyses to interpret. To re-examination of the deposition ages and provenances of the Kanmon Group, we analyzed detrital zircon ages. Age results of this study were shown in the Table and Fig. (A).
New obtained YC1 σ of the Sujigahama and Shihama formations indicate 97 Ma and 101 Ma, respectively. Moreover, considering the age of the Kawara granite (94.8 ±0.9 Ma), the age of the upper most of the Shimonoseki Subgroup is thought to be in Cenomanian. On the other hand, YC1 σ of the Sengoku Formation, the lowermost of the Wakino Subgroup and the Yoshimo Formation, Toyonishi Group indicate similar values of 128 Ma and 130 Ma, respectively. The fact exhibits that the formations are contemporaneous heterotopic facies each other.
Contradictions about ages are also shown. “The age of the tuff bet” in the Kitahikoshima Formation was reported as 106.3 ±1.0 Ma which is older than YC1 σ of the Shiohama Formation which is stratigraphically lower than the Kitahikoshima Formation. The contradiction can be solved to think that the zircon grains were detrital origin and which YC1 σ indicate 99.3 ±1.3 Ma. Another contradiction is that the Lower Wakamiya Formation is too young. Additional research is necessary to solve the contradiction.

Keywords: Kanmon Group, detrital, zircon age, sandstone, tuff

Table. Youngest age indexes for detrital zircons from each sample.

Sample		n of data		YSG	YC1σ			YC2σ		
		All	Conc.	Age (Ma)	Age (Ma)	n	MSWD	Age (Ma)	n	MSWD
Kanmon Group										
SJ*	Sujigahama Fm.	47	33	99.9 ± 1.9	101.0 ± 0.8	3	0.64	103.2 ± 0.4	9	2.16
SJH	Sujigahama Fm.	168	160	94.4 ± 1.7	96.6 ± 0.6	9	0.35	99.2 ± 0.3	42	0.92
SHI*	Shiohama Fm.	39	28	98.1 ± 1.1	98.7 ± 0.6	2	0.44	100.0 ± 0.5	5	2.36
SOH	Shiohama Fm.	155	148	98.4 ± 2.3	101.3 ± 0.9	30	0.43	104.6 ± 0.5	102	1.15
GMO	Kumagai Fm. (Eq. Upper Wakamiya Fm.)	56	47	102.1 ± 2.3	113.9 ± 0.9	2	0.93	113.5 ± 0.7	4	3.12
WA*	Lower Wakamiya Fm.	37	22	105.2 ± 1.0	105.5 ± 0.9	2	0.41	107.2 ± 0.5	4	2.05
SG	Sengoku Fm.	170	157	126.4 ± 3.3	127.6 ± 1.9	2	0.19	177.1 ± 0.9	10	3.30
Toyonishi Group										
YM*	Yoshimo Fm.	33	28	125.2 ± 1.8	221.8 ± 2.0	2	0.21	226.4 ± 1.4	3	6.02
YSM	Yoshimo Fm.	117	98	127.7 ± 1.7	129.7 ± 1.1	3	1.23	130.4 ± 0.9	4	1.51
KS*	Kiyosue Fm.	60	55	124.6 ± 1.1	135.4 ± 0.8	3	0.66	135.4 ± 0.8	3	0.66

Errors are 1σ, *: data from Aoki et al. (2014)

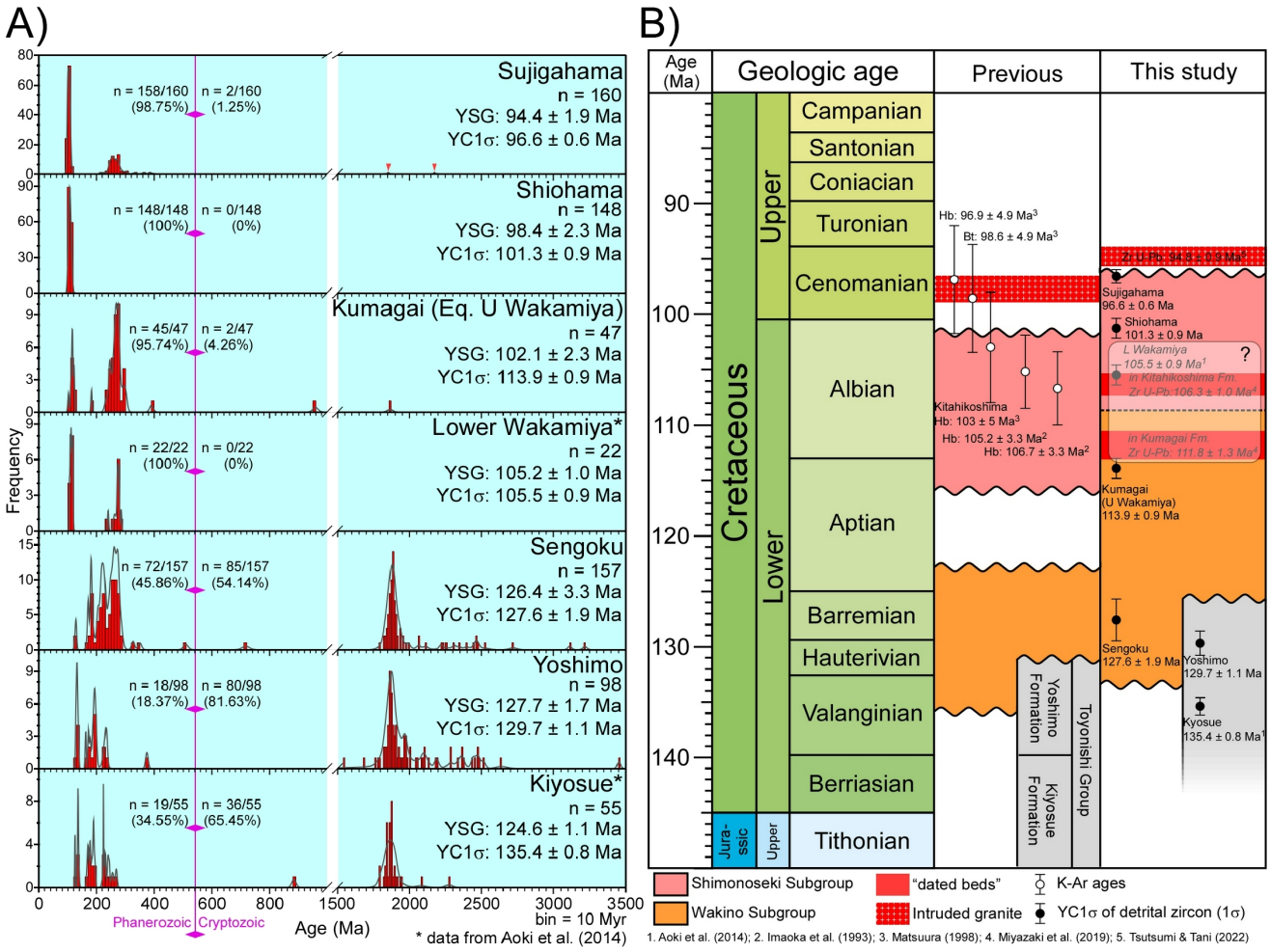


Figure. (A) Probability density diagrams and histograms of concordant age data from each sample. ^{238}U-$^{206}Pb^*$ ages are used for less than or equal to 1000 Ma data and $^{207}Pb^*/^{206}Pb^*$ ages are used for the other data. (B) Stratigraphic charts of Kanmon Group. Previous age estimation is modified after Matusmoto et al. (1982).

U-Pb zircon age of granitoids in the Aoyama area, Ryoke belt, SW Japan

*Fumiko HIGASHINO[1], Tetsuo KAWAKAMI[1], Shuhei SAKATA[2], Shunpei Kudo[1], Yohei IGAMI[1]

1. Kyoto Univ. Sci., 2. Univ. Tokyo

The Ryoke belt shows an elongated distribution over 800 km in Southwest Japan, which is mainly composed of Late Cretaceous high-*T*/low-*P* type metamorphic rocks and plutonic rocks. Whereas the early geochronological studies report eastward younging of Rb-Sr whole rock ages of granitic rocks [e.g., 1, 2], some U-Pb zircon ages and chemical Th-U-total Pb isochron method (CHIME) monazite ages of granitoids are not consistent with the trend [3, 4]. The Aoyama area is one of the well-studied areas in the Ryoke belt, where high-grade pelitic and psammitic metamorphic rocks and granitoids are widely exposed. Since it is apparent that the U-Pb zircon ages of granitoids are not sufficiently available to understand the spatiotemporal evolution of magmatism in the Aoyama area, we performed LA-ICPMS zircon U-Pb dating for six samples out of five granitoids.
Magmatic zircon domains were selected based on microstructural constraint under CL images. Using analyses with concordance between 97-103 %, the weighted-mean U-Pb age is only calculated for one sample. As a result, crystallization timings of granitoids are constrained respectively as ca. 83-75 Ma for Kabuto granodiorite, ca. 76-65 Ma and ca. 77-70 Ma for Ao granite, ca. 92-84 Ma for Joryu tonalite, 75 ±1 Ma for Misugi tonalite, and ca. 110-99 Ma for Kimigano granodiorite.
Zircon in the Misugi tonalite has a multi-phase inclusion composed of cristobalite, kumdykolite, apatite and glass. Mineral assemblage of cristobalite and kymdykolite is reported in nanogranite in garnet from high-*T* metamorphic rock, which is interpreted to be metastable phases [5]. These minerals found in this study are also considered to be metastable, suggesting rapid crystallization from the granitic melt. Further analyses for inclusion in zircon would help understand the range of crystallization timing of granitoids.
[1] Nakajima (1994) Lithos [2] Nakajima et al. (1990) CMP [3] Suzuki & Adachi (1998) JMG [4] Takatsuka et al. (2018) Island Arc [5] Ferrero et al. (2016) CMP

Keywords: granite, zircon, melt inclusion, metastable phase

Oral presentation

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson:Takashi Yuguchi, Atsushi Kamei

Sat. Sep 16, 2023 10:15 AM - 12:00 PM 820 (Sugimoto Campus)

[zoom]Zoom

Zoom

Oral presentation | R5: Extraterrestrial materials

Sat. Sep 16, 2023 2:00 PM - 3:00 PM JST | Sat. Sep 16, 2023 5:00 AM - 6:00 AM UTC | 821 Sugimoto Campus

R5: Extraterrestrial materials

Chairperson:Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Shogo Tahibana

2:00 PM - 2:15 PM JST | 5:00 AM - 5:15 AM UTC

[R5-12] Chemical Composition of Circumstellar Amorphous Silicate Dust: Condensation Experiments in the Na-Mg-Al-Si-Ca-Fe-Ni-O System

*Hanako Enomoto[1], Aki Takigawa[1] (1. UTokyo)

2:15 PM - 2:30 PM JST | 5:15 AM - 5:30 AM UTC

[R5-13] Survivability of presolar SiC grains in the protosolar disk: An experimental study

*Daiki YAMAMOTO[1], Aki TAKIGAWA[2], Shogo TACHIBANA[2] (1. Kyushu University, 2. University of Tokyo)

2:30 PM - 2:45 PM JST | 5:30 AM - 5:45 AM UTC

[R5-14] Antarctic micrometeorites containing pseudomorphs of melanophlogite: Dust from the sub-surface ocean of icy satellites or from an unknown type of trans-Neptunian objects?

*Takaaki NOGUCHI[1], Takuya Mitsunari[2,3], Rikako Matsumoto[4,5], Akira Yamaguchi[6], Naoya Imae[6], Toru Matsumoto[1], Toru Araki[7], Hayato Yuzawa[7], Akira Miyake[1] (1. Kyoto Univ. Sci., 2. Ibaraki Univ. Sci., 3. Mitsubishi Elect. Soft. Co., 4. Kyushu Univ. Sci., 5. Ine T.H., 6. NIPR, 7. IMS)

2:45 PM - 3:00 PM JST | 5:45 AM - 6:00 AM UTC

[R5-15] **Studies of Earth's minerals and rocky mixtures beyond Earth**

*Yasunori MIURA[1] (1. Post Yamaguchi Univ. Sci.)

[zoom] Zoom

Chemical Composition of Circumstellar Amorphous Silicate Dust: Condensation Experiments in the Na-Mg-Al-Si-Ca-Fe-Ni-O System

*Hanako Enomoto[1], Aki Takigawa[1]

1. UTokyo

Keywords: circumstellar dust, amorphous silicate, experiment

表 1　出発物質の化学組成

実験	Mg	Si	Fe	Al	Ca	Na	Ni
CI-02	1.03	1.00	0.85	0.08	0.06	0.06	0.05
CI-03	1.03	1.00	-	0.08	0.06	0.06	-
CI-04	1.03	1.00	-	0.75	0.06	0.06	-
$Al_8Si_{100}Mg_{103}$	1.03	1.00	-	0.08	-	-	-
$Al_{31}Si_{100}Mg_{103}$	1.03	1.00	-	0.31	-	-	-
$Al_{64}Si_{100}Mg_{103}$	1.03	1.00	-	0.64	-	-	-
$Al_8Si_{100}Ca_{103}$	-	1.00	-	0.08	1.03	-	-
$Al_8Si_{100}Mg_{51.5}Ca_{51.5}$	0.515	1.00	-	0.08	0.515	-	-

Survivability of presolar SiC grains in the protosolar disk: An experimental study

*Daiki YAMAMOTO[1], Aki TAKIGAWA[2], Shogo TACHIBANA[2]

1. Kyushu University, 2. University of Tokyo

Keywords: Presolar grains, Silicon carbide (SiC), Evaporation/Oxidation, Kinetics, Protosolar disk

Antarctic micrometeorites containing pseudomorphs of melanophlogite: Dust from the sub-surface ocean of icy satellites or from an unknown type of trans-Neptunian objects?

*Takaaki NOGUCHI[1], Takuya Mitsunari[2,3], Rikako Matsumoto[4,5], Akira Yamaguchi[6], Naoya Imae[6], Toru Matsumoto[1], Toru Araki[7], Hayato Yuzawa[7], Akira Miyake[1]

1. Kyoto Univ. Sci., 2. Ibaraki Univ. Sci., 3. Mitsubishi Elect. Soft. Co., 4. Kyushu Univ. Sci., 5. Ine T.H., 6. NIPR, 7. IMS

Keywords: AMM, melanophlogite, sub-surface ocean, solar flare track

Studies of Earth’ s minerals and rocky mixtures beyond Earth

*Yasunori MIURA[1]

1. Post Yamaguchi Univ. Sci.

Minerals of the Earth are formed by active state changes in the three state zones. Without an extraterrestrial ocean system, Earth type mineral is difficult to form. There are local and global phenomena on the Earth, though the formation of the global solid systems requires the ocean system. It cannot be specified in meteorite classification unless it is used a macro- mineral name [1-3].

Keywords: Earth mineral , Rocky mixtures, Meteorite, The Moon, Ocean system

Oral presentation

R5: Extraterrestrial materials

Chairperson:Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Shogo Tahibana

Sat. Sep 16, 2023 2:00 PM - 3:00 PM 821 (Sugimoto Campus)

[zoom]Zoom

Zoom

Oral presentation | R3: High-pressure science and deep Earth's material

Sat. Sep 16, 2023 2:00 PM - 3:00 PM JST | Sat. Sep 16, 2023 5:00 AM - 6:00 AM UTC | 822 Sugimoto Campus

R3: High-pressure science and deep Earth's material

Chairperson:Takaaki Kawazoe(Hiroshima University), Takeshi Sakai(Ehime University), Masayuki Nishi(Osaka University)

2:00 PM - 2:15 PM JST | 5:00 AM - 5:15 AM UTC

[R3-12] High temperature formation of the oxygen-rich Martian core

*Eiji OHTANI[1], William F McDonough[1,2] (1. Tohoku University, 2. University of Maryland)

2:15 PM - 2:30 PM JST | 5:15 AM - 5:30 AM UTC

[R3-13] Microtexture evolution of pure aluminum severely deformed at static high pressures

*Takuo OKUCHI[1,2], Yuto TANAKA[2,1], Naotaka TOMIOKA[3], Tomokazu SANO[4], Tomoki MATSUDA[4], Kazuto ARAKAWA[5], Yusuke SETO[6] (1. Kyoto Univ. KURNS, 2. Kyoto Univ. Mech. Eng., 3. Kochi JAMSTEC, 4. Osaka Univ. Eng., 5. Shimane Univ. NEXTA, 6. Osaka Metropolitan Univ. Sci.)

2:30 PM - 2:45 PM JST | 5:30 AM - 5:45 AM UTC

[R3-14] **Quantitative chemical analysis of the fine textures of natural and synthetic materials using ATEM**

*Kiyoshi FUJINO[1], Naotaka TOMIOKA[2], Hiroaki OHFUJI[3] (1. Non, 2. JAMSTEC, 3. Tohoku Univ.)

2:45 PM - 3:00 PM JST | 5:45 AM - 6:00 AM UTC

[R3-15] Synthesis of polycrystalline diamond from glassy carbon by direct conversion at high pressure and temperature

Chinatsu Ogawa[1], *Tetsuo Irifune[1], Sayako Inoue[1], Takehiro Kunimoto[1], Toru Shinmei[1], Akimasa Suzumura[2], Shoichi Itoh[2] (1. Ehime University, 2. Kyoto University)

[zoom] Zoom

High temperature formation of the oxygen-rich Martian core

*Eiji OHTANI[1], William F McDonough[1,2]

1. Tohoku University, 2. University of Maryland

Discovery of a large Martian core with a large radius and low mean density around 6~6.5 g/cm^3 provided a new constraint for the composition of the Martian core. The early Martian core formation inferred from W-Hf data of SNC meteorites revealed that the fractionation and core formation of Mars occurred within the first 5 million years after the CAI formation, resulting in the super-liquidus temperature during the core formation stage of Mars due to existence of radiogenic element such as ^{26}Al in the early solar system. The metallic iron-silicate partitioning of oxygen and sulfur indicates a high concentration of oxygen at high temperature 400-600 K above the liquidus of the Martian mantle. Thus, the major light elements in the Martian core may be oxygen instead of sulfur, which can account for the observed density and compressional velocity of the Martian core. Liquid immiscibility in the Fe-O-S Martian core during cooling may explain the evolution and extinction of the Martian core dynamo.

Keywords: Martian core, Oxygen, liquid immscibility

Microtexture evolution of pure aluminum severely deformed at static high pressures

*Takuo OKUCHI[1,2], Yuto TANAKA[2,1], Naotaka TOMIOKA[3], Tomokazu SANO[4], Tomoki MATSUDA[4], Kazuto ARAKAWA[5], Yusuke SETO[6]

1. Kyoto Univ. KURNS, 2. Kyoto Univ. Mech. Eng., 3. Kochi JAMSTEC, 4. Osaka Univ. Eng., 5. Shimane Univ. NEXTA, 6. Osaka Metropolitan Univ. Sci.

Keywords: Microtexture of metal, Static high pressure, Stress field, Dislocation, Aluminium

Quantitative chemical analysis of the fine textures of natural and synthetic materials using ATEM

*Kiyoshi FUJINO[1], Naotaka TOMIOKA[2], Hiroaki OHFUJI[3]

1. Non, 2. JAMSTEC, 3. Tohoku Univ.

Keywords: Analytical TEM, Quantitative chemical analysis, Absorption correction

Synthesis of polycrystalline diamond from glassy carbon by direct conversion at high pressure and temperature

Chinatsu Ogawa[1], *Tetsuo Irifune[1], Sayako Inoue[1], Takehiro Kunimoto[1], Toru Shinmei[1], Akimasa Suzumura[2], Shoichi Itoh[2]

1. Ehime University, 2. Kyoto University

Synthesis and characterization of polycrystalline diamond from bulk samples of glassy carbon have been made at pressures 9, 12, and 15 GPa and temperatures from 1800 to 2300℃ using multi-anvil apparatus. The minimum temperature for synthesis of pure polycrystalline diamond was determined as 1700℃ at 15 GPa, which significantly increases with decreasing pressure and reaches 2300℃ at 12 GPa and the minimum temperature is suggested to be even higher than 3000℃ at 9 GPa based on the present and earlier studies. TEM observations on some recovered samples show developments of graphitic layers in the disorganized nano-structures of original glassy carbon, particularly in those samples synthesized at temperatures around 2000℃ at 9 and 12 GPa. The significant increase in the minimum temperature with decreasing pressure may be due to the metastable growth of graphitic layers in glassy carbon, which should kinetically hinder complete conversion to diamond at the lower pressures approaching the graphite-diamond phase boundary.

Keywords: diamond, high-pressure synthesis, nano-polycrystals, glassy carbon, TEM observations

Oral presentation

R3: High-pressure science and deep Earth’ s material

Chairperson:Takaaki Kawazoe(Hiroshima University), Takeshi Sakai(Ehime University), Masayuki Nishi(Osaka University)

Sat. Sep 16, 2023 2:00 PM - 3:00 PM 822 (Sugimoto Campus)

[zoom]Zoom

Zoom

Poster presentation | S1: Dynamics of igneous processes (Special Session)

Sat. Sep 16, 2023 12:00 PM - 2:00 PM JST | Sat. Sep 16, 2023 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

S1: Dynamics of igneous processes (Special Session)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[S1P-01] Injection of K_2O-rich magma into magma chambers beneath Myoko volcano

*Morihisa HAMADA[1], Estelle F. ROSE-KOGA[2], Kenneth T. KOGA[2], Kenji SHIMIZU[1], Takayuki USHIKUBO[1], Hideo HARADA[3], Andereas AUER[4], Yoshiaki YAMAGUCHI[3] (1. JAMSTEC, 2. ISTO, CNRS-Universite d'Orleans, 3. Shinshu Univ., 4. Shimane Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[S1P-02] Repressurization of vesiculated magma inferred from volatile distribution in groundmass glass

*Shumpei YOSHIMURA[1] (1. Hokkaido University)

Injection of K_2O-rich magma into magma chambers beneath Myoko volcano

*Morihisa HAMADA[1], Estelle F. ROSE-KOGA[2], Kenneth T. KOGA[2], Kenji SHIMIZU[1], Takayuki USHIKUBO[1], Hideo HARADA[3], Andereas AUER[4], Yoshiaki YAMAGUCHI[3]

1. JAMSTEC, 2. ISTO, CNRS-Universite d'Orleans, 3. Shinshu Univ., 4. Shimane Univ.

Heterogeneous groundmass bearing higher-K_2O and lower-K_2O domains is often observed in volcanic rocks collected from the rear-arc region. This study characterizes concurrent occurrence of both higher-K_2O and lower-K_2O magmas preserved in quenched melt inclusions collected from Myoko volcano, a rear-arc volcano on the western margin of the northeast Japan arc. While the melt inclusions found in the scoriae from the Sekiyama eruption of Myoko volcano (43 ka) represent the whole-rock composition of Myoko’ s lower-K_2O volcanic rocks, some melt inclusions found in the scoriae of the Kannoki eruption (41 ka) represent higher-K_2O domains in the groundmass. A possible explanation for such contrastive observations is that the mantle source beneath Myoko volcano is heterogeneous; the higher-K_2O magmas could be generated in a metasomatized mantle wedge, possibly veined by phlogopite and/or apatite-bearing dykes. Another possible explanation is that higher-K_2O magma is a product of partial melting of crustal rocks and its mingling with lower-K_2O magma before the Kannoki eruption. In either case, K_2O-rich magma batches were repeatedly injected into the main magma chambers and formed heterogeneous groundmass bearing higher-K_2O and lower-K_2O domains. Further geochemical studies are warranted to constrain the origin of K_2O-rich magma.

Keywords: Myoko volcano, melt inclusion

Repressurization of vesiculated magma inferred from volatile distribution in groundmass glass

*Shumpei YOSHIMURA[1]

1. Hokkaido University

Keywords: magma, vesiculation, repressurization, bubble

Poster presentation | R3: High-pressure science and deep Earth's material

Sat. Sep 16, 2023 12:00 PM - 2:00 PM JST | Sat. Sep 16, 2023 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R3: High-pressure science and deep Earth's material

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-01] Carbon isotope analysis of diamond/graphite recovered from high-pressure experiments by NanoSIMS and IRMS

Hideaki Kawamura[1], *Hiroaki OHFUJI[1], Satish-Kumar Satish-Kumar[2], Kiran Sasidharan[2], Akizumi Ishida[1], Kouhei Sasaki[3], Naoto Takahata[3], Kotaro Shirai[3], Akio Suzuki[1] (1. Tohoku Univ. Sci, 2. Niigata Univ. Sci., 3. Univ. Tokyo, AORI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-02] Diamond formation at upper mantle of ice giants

Yoshiki Kenmochi[1], *Takeshi SAKAI[1], Hirokazu Kadobayashi[2] (1. Ehime University, 2. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-03] Post-antigorite reaction in cold slab

*Tomoaki KUBO[1], Shingo Yoshida[1], Rikuto Honda[1], Yuta Hiramoto[1], Noriyoshi Tsujino[2], Sho Kakizawa[2], Yuji Higo[2] (1. Kyushu University, 2. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-04] On the low temperature plasticity of metastable olivine

[Presentation award entry]

*Rikuto Honda[1], Tomoaki Kubo[1], Noriyoshi Tsujino[2], Yuji Higo[2], Sho Kakizawa[2], Yuki Shibazaki[3], Yu Nishihara[4] (1. Kyushu Univ., 2. JASRI, 3. KEK, 4. Ehime Univ. GRC)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-05] Deformation property of Wüstite polycrystals developed by large strain deformation experiments under lower mantle pressures using rotational DAC

[Presentation award entry]

*Bunrin Natsui[1], Shintaro Azuma[1], Keishi Okazaki[2], Kentaro Uesugi[3], Masahiro Yasutake[3], Saori Kawaguchi[3], Ryuichi Nomura[4], Kenji Ohta[1] (1. Tokyo Tech, 2. Hiroshima Univ., 3. JASRI, 4. Kyoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-06] High-temperature conditions for the rotational diamond anvil cell by near-infrared heating method

*Shintaro AZUMA[1], Keishi Okazaki[2], Kentaro Uesugi[3], Masahiro Yasutake[3], Bunrin Natsui[1], Eranga Jayawickrama[2], Ryuichi Nomura[4] (1. Tokyo Institute of Technology, 2. Hiroshima University, 3. JASRI, 4. Kyoto University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-07] Measurements of local stress and high pressure phase transition of Fe in in-situ TEM indentation experiments

*Akira MIYAKE[1], Yohei Igami[1], Ryuichi nomura[1] (1. Kyoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-08] Real-time measurement of DAC specimen length: Direct measurement of back-to-back distance between diamond anvils and elastic deformation analysis of diamond anvils.

*Akira Yoneda[1], Takuto Kato[1] (1. Osaka Univ. Sci.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-09] Density measurement of Ni under high pressure and high temperature using laser-heated DAC combined with X-ray absorption method

*Hidenori TERASAKI[1], Hiroyuki KAMINA[1], Ryo TSURUOKA[2], Tadashi KONDO[2], Akira YONEDA[2], Ko MORIOKA[1], Moe SAKURAI[1], Seiji KAMADA[3], Saori I KAWAGUCHI[4] (1. Okayama University, 2. Osaka University, 3. Tohoku University, 4. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-10] Density measurement of FeS by X-ray absorption method with laser-heated diamond anvil cell

[Presentation award entry]

*Ko Morioka[1], Hidenori Terasaki[1], Hiroyuki Kamina[1], Ryo Tsuruoka[2], Tadashi Kondo[2], Akira Yoneda[2], Moe Sakurai[1], Saori Kawaguchi[3] (1. Okayama Univ. Sci., 2. Osaka Univ. Sci., 3. JASRI)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-11] Neutron diffraction measurements and molecular dynamics simulations on FeS hydrides

[Presentation award entry]

*Masahiro Takano[1], Hiroyuki Kagi[1], Yuichiro Mori[1], Katsutoshi Aoki[1], Sho Kakizawa[2], Asami Sano[3], Riko Iizuka[4], Taku Tsuchiya[5] (1. The Univertsity of Tokyo, 2. JASRI, 3. J-PARC, 4. Waseda University, 5. Ehime University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-12] Melting relations in the system Fe-FeS-FeO at 3 GPa

Kosuke Tsuji[1], *Satoru URAKAWA[1], Hidenori Terasaki[1] (1. Okayama University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R3P-13] Bismuth at high temperature and high pressure

*Shigeaki ONO[1] (1. Japan Agency for Marine-Earth Science and Technology (JAMSTEC))

Carbon isotope analysis of diamond/graphite recovered from high-pressure experiments by NanoSIMS and IRMS

Hideaki Kawamura[1], *Hiroaki OHFUJI[1], Satish-Kumar Satish-Kumar[2], Kiran Sasidharan[2], Akizumi Ishida[1], Kouhei Sasaki[3], Naoto Takahata[3], Kotaro Shirai[3], Akio Suzuki[1]

1. Tohoku Univ. Sci, 2. Niigata Univ. Sci., 3. Univ. Tokyo, AORI

Keywords: Diamond, C-H-O fluid, NanoSIMS, Carbon isotope

Diamond formation at upper mantle of ice giants

Yoshiki Kenmochi[1], *Takeshi SAKAI[1], Hirokazu Kadobayashi[2]

1. Ehime University, 2. JASRI

Keywords: Diamond, Ice giants

Post-antigorite reaction in cold slab

*Tomoaki KUBO[1], Shingo Yoshida[1], Rikuto Honda[1], Yuta Hiramoto[1], Noriyoshi Tsujino[2], Sho Kakizawa[2], Yuji Higo[2]

1. Kyushu University, 2. JASRI

Keywords: in-situ X-ray observation, high pressure experiment, dehydration reaction, deep slab

On the low temperature plasticity of metastable olivine

*Rikuto Honda[1], Tomoaki Kubo[1], Noriyoshi Tsujino[2], Yuji Higo[2], Sho Kakizawa[2], Yuki Shibazaki[3], Yu Nishihara[4]

1. Kyushu Univ., 2. JASRI, 3. KEK, 4. Ehime Univ. GRC

Keywords: metastable olivine, Peierls mechanism, deep slab rheology, high-pressure deformation experiments, X-ray in-situ observation

Deformation property of Wüstite polycrystals developed by large strain deformation experiments under lower mantle pressures using rotational DAC

*Bunrin Natsui[1], Shintaro Azuma[1], Keishi Okazaki[2], Kentaro Uesugi[3], Masahiro Yasutake[3], Saori Kawaguchi[3], Ryuichi Nomura[4], Kenji Ohta[1]

1. Tokyo Tech, 2. Hiroshima Univ., 3. JASRI, 4. Kyoto Univ.

Keywords: Rheology, Deformation experiment, Lower mantle, Wüstite

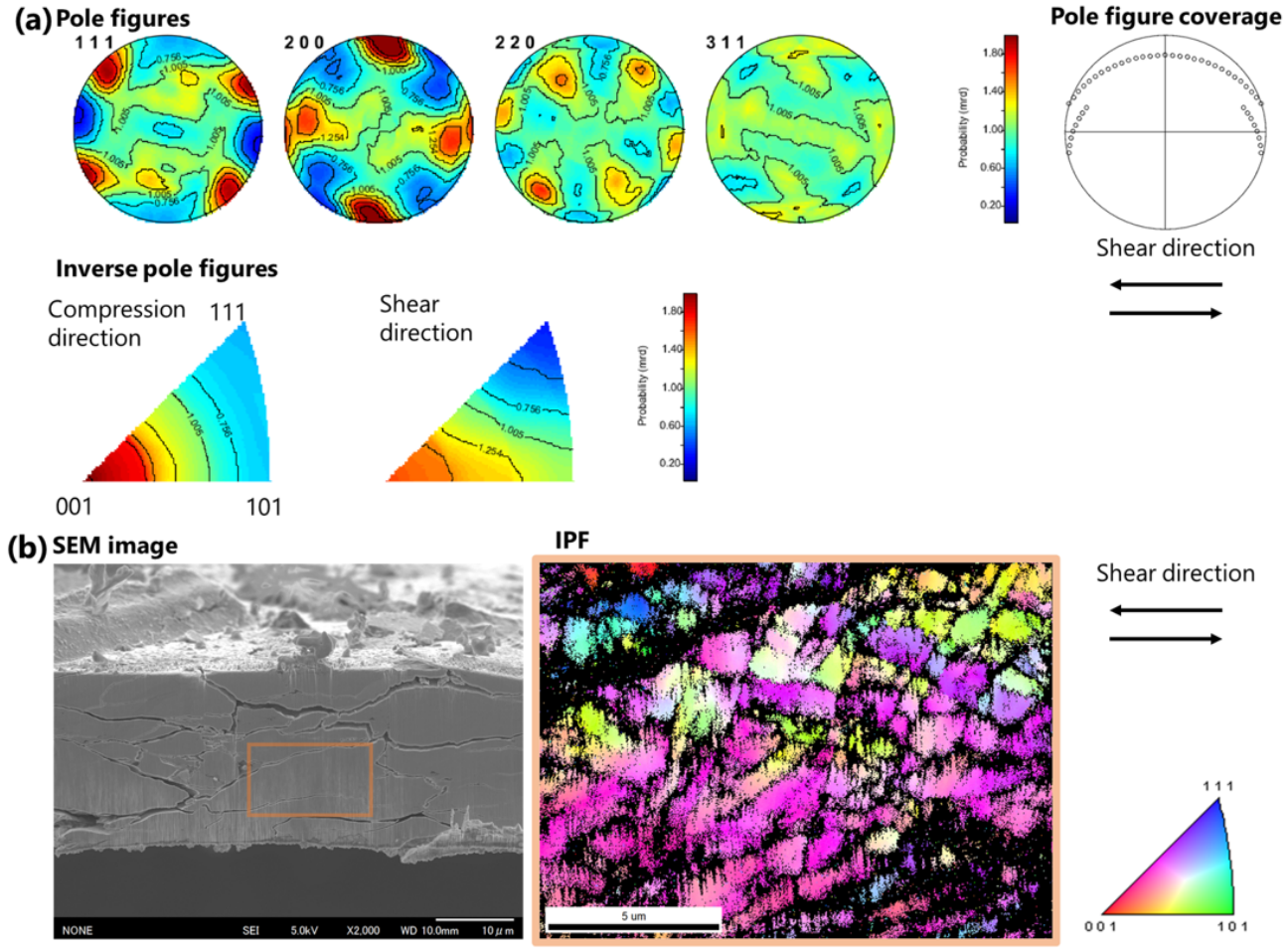


図 結晶方位データ
rDACによるねじり変形実験後のWüstite(結晶構造:B1 ε =0.3 T=600 K P=8 GPa)
(a) XRDデータの解析より得られたCPO
(b) EBSD分析より得られた結晶方位マッピング

High-temperature conditions for the rotational diamond anvil cell by near-infrared heating method

*Shintaro AZUMA[1], Keishi Okazaki[2], Kentaro Uesugi[3], Masahiro Yasutake[3], Bunrin Natsui[1], Eranga Jayawickrama[2], Ryuichi Nomura[4]

1. Tokyo Institute of Technology, 2. Hiroshima University, 3. JASRI, 4. Kyoto University

Keywords: Rotational diamond anvil cell, high temperature and pressure, near-infrared heating method

Measurements of local stress and high pressure phase transition of Fe in in-situ TEM indentation experiments

*Akira MIYAKE[1], Yohei Igami[1], Ryuichi nomura[1]

1. Kyoto Univ.

Two types of in-situ experiments in transmission electron microscope were performed. The result of indentation experiment using diamond rod and plate shows the maximum pressure value is over 400 GPa at 1000 uN load. Another in situ high pressure experiment shows the phase transition from alpha phase of Fe (iron) to epsilon phase at 200 uN load. At this load experiment, the pressure was estimated to be about 14 GPa.

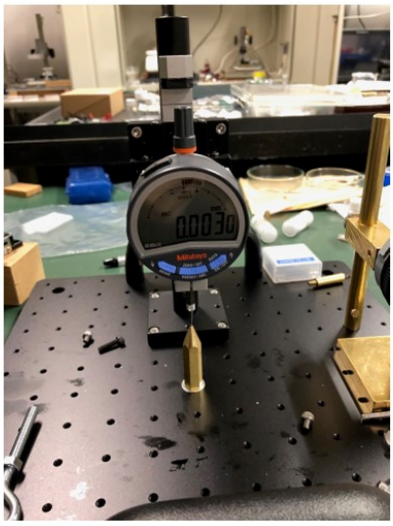
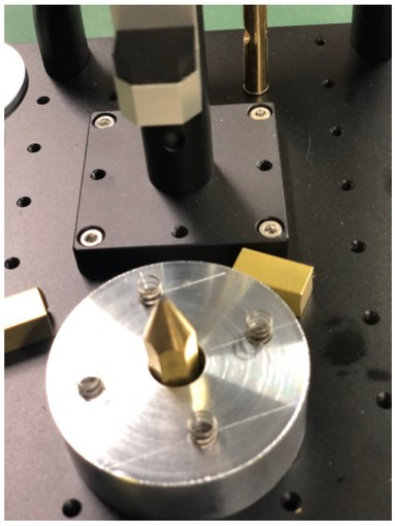
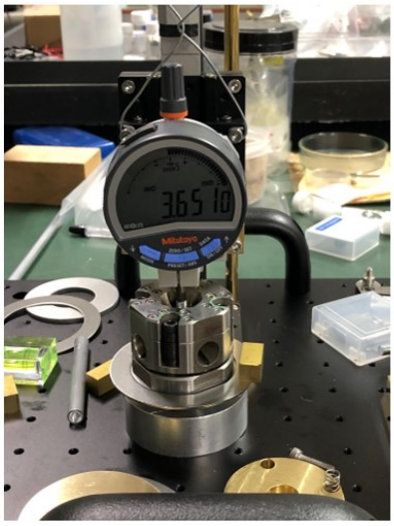
Keywords: TEM, high pressure phase transition, in situ experiment

Real-time measurement of DAC specimen length: Direct measurement of back-to-back distance between diamond anvils and elastic deformation analysis of diamond anvils.

*Akira Yoneda[1], Takuto Kato[1]

1. Osaka Univ. Sci.

Keywords: DAC, elastic deformation, Distance measuring instrument, GHz ultrasonics

Density measurement of Ni under high pressure and high temperature using laser-heated DAC combined with X-ray absorption method

*Hidenori TERASAKI[1], Hiroyuki KAMINA[1], Ryo TSURUOKA[2], Tadashi KONDO[2], Akira YONEDA[2], Ko MORIOKA[1], Moe SAKURAI[1], Seiji KAMADA[3], Saori I KAWAGUCHI[4]

1. Okayama University, 2. Osaka University, 3. Tohoku University, 4. JASRI

Keywords: Density, Core, X-ray absorption method, High pressure

Density measurement of FeS by X-ray absorption method with laser-heated diamond anvil cell

*Ko Morioka[1], Hidenori Terasaki[1], Hiroyuki Kamina[1], Ryo Tsuruoka[2], Tadashi Kondo[2], Akira Yoneda[2], Moe Sakurai[1], Saori Kawaguchi[3]

1. Okayama Univ. Sci., 2. Osaka Univ. Sci., 3. JASRI

Keywords: Density, Core, Diamond anvil cell, High pressure

Neutron diffraction measurements and molecular dynamics simulations on FeS hydrides

*Masahiro Takano[1], Hiroyuki Kagi[1], Yuichiro Mori[1], Katsutoshi Aoki[1], Sho Kakizawa[2], Asami Sano[3], Riko Iizuka[4], Taku Tsuchiya[5]

1. The Univertsity of Tokyo, 2. JASRI, 3. J-PARC, 4. Waseda University, 5. Ehime University

Keywords: FeS, hydrogen, neutron diffraction, high-pressure experiments, molecular dynamics

Melting relations in the system Fe-FeS-FeO at 3 GPa

Kosuke Tsuji[1], *Satoru URAKAWA[1], Hidenori Terasaki[1]

1. Okayama University

Keywords: Core, Light elements

Bismuth at high temperature and high pressure

*Shigeaki ONO[1]

1. Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

We investigated the phase diagram in bismuth at high pressures and high temperatures using the multi-anvil press and the synchrotron X-ray diffraction technique. The stability of each phase was identified by observing the powdered X-ray diffraction data. The phase diagram determined in our study was in general agreement with that reported in previous high-pressure experiments. However, discrepancies related with triple points were identified between present and previous studies.

Keywords: Bismuth

Poster presentation | R5: Extraterrestrial materials

Sat. Sep 16, 2023 12:00 PM - 2:00 PM JST | Sat. Sep 16, 2023 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R5: Extraterrestrial materials

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R5P-01] Structural Evolution of Dynamically-compressed Germanium Dioxide

*Hiroto Araga[1,2], Yuhei Umeda[1,2], Takamichi Kobayashi[3], Hitoshi Yusa[3], Yusuke Seto[4], Takuo Okuchi[1,2] (1. Kyoto Univ. Eng., 2. KURNS Kyoto Univ., 3. NIMS, 4. Osaka Metropolitan Univ. Sci.)

Structural Evolution of Dynamically-compressed Germanium Dioxide

*Hiroto Araga[1,2], Yuhei Umeda[1,2], Takamichi Kobayashi[3], Hitoshi Yusa[3], Yusuke Seto[4], Takuo Okuchi[1,2]

1. Kyoto Univ. Eng., 2. KURNS Kyoto Univ., 3. NIMS, 4. Osaka Metropolitan Univ. Sci.

Keywords: GeO2, Shock compression, amorphous, powder XRD diffraction

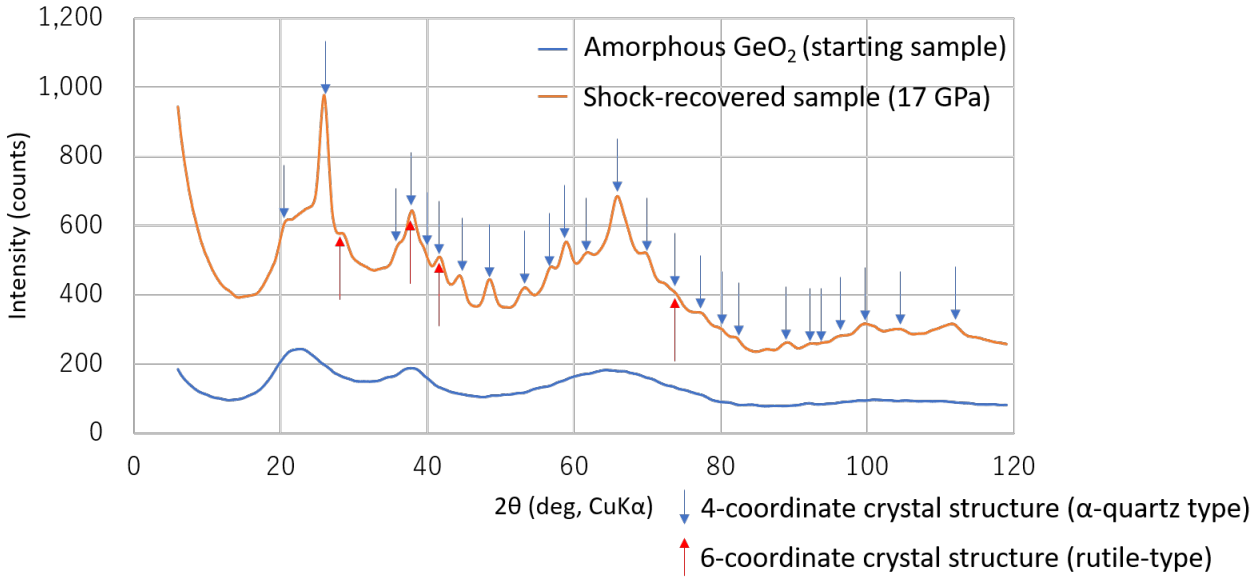


Fig.1 Powder XRD diffraction patterns of the shock-recovered sample and an amorphous GeO_2 before compression.

Poster presentation | R6: Plutonic rocks, volcanic rocks and subduction factory

Sat. Sep 16, 2023 12:00 PM - 2:00 PM JST | Sat. Sep 16, 2023 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-01] Compositional changes in closed and open systems of igneous rocks from northern part of Mt. Shaku-dake, northern Kyushu, SW Japan

*Keisuke ESHIMA[1] (1. Yamaguchi Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-02] Formation of upper-most crust in volcanic belt: Example for Cretaceous volcano–plutonic complex, Hyogo Prefecture, southwest Japan

*Masaaki OWADA[1], Shunsuke Fukuda[1], Atsushi Kamei[2] (1. Yamaguchi University, 2. Shimane University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-03] **Intrusion and emplacement processes of adakitic magma into the shallow crust: A case study of the Sakainokami plutonic body, Kitakami mountains, northeast Japan**

[Presentation award entry]

*Satoshi SUZUKI[1], Nobuo ASAI[1], Kazuo NAKASHIMA[1], Yasuhiro OGITA[2], Tatsunori YOKOYAMA[2], Shuhei SAKATA[3], Takeshi OHNO[4], Takashi YUGUCHI[5] (1. Yamagata Univ., 2. Japan Atomic Energy Agency, 3. Univ of Tokyo. , 4. Gakushuin Univ. , 5. Kumamoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-04] Identification of multiple components of noble gas isotopes in back-arc lithospheric mantle

*Lena Yokokura[1], Hirochika Sumino[1], Takeshi Kuritani[2], Yuuki Hagiwara[3], Junji Yamamoto[4] (1. The University of Tokyo, 2. Hokkaido University, 3. JAMSTEC, 4. Kyushu University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-05] Three-dimensional evaluation of internal structures contributing to mass transport distributed in minerals: micropores in K-feldspar in the Toki granite, central Japan.

*Mai Nonaka[1,2], Takashi Yuguchi[3] (1. Yamagata University, 2. Japan Atomic Energy Agency, 3. Kumamoto University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-06] Magma source and evolution process for Quaternary Magmas from Kuju Volcanoes, Kyushu Island, Southwest Japan Arc.

*Soma Yamanaka[1], Tomoyuki Shibata[3], Ryotaro Fujihara[1], Tatsuki Orito[1], Taichi Heijima[1], Masako Yoshikawa[3], Tomo Shibata[2] (1. Hiroshima Univ. Sci., 2. Fukuoka Univ. Sci., 3. Hiroshima Univ. Sci. & Tech.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-07] Geochemical features of the Early Miocene Hachiya Formation in the Chuno Area, Gifu Prefecture, Japan

[Presentation award entry]

*Seiya Saijou[1], Toshiro Takahashi[2] (1. Niigata Univ. Sci., 2. Niigata Univ)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-09] Cathodoluminescence pattern of quartz and quantitative determination of titanium and aluminum concentration within quartz crystals in the Tono plutonic complex, Kitakami

mountains

*Yasuhiro OGITA[1,2], Takenri KATO[3], Takashi YUGUCHI[4] (1. Yamagata Univ., 2. JAEA, 3. Nagoya Univ., 4. Kumamoto Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-10] Cathodoluminescence patterns of quartz crystals in granite and their titanium concentrations: implication to crystallization process of quartz in the magma chamber

*Asuka Kato[1], Takenori Kato[2], Yasuhiro Ogita[1,3], Takashi Yuguchi[4], Eiji Sasao[3] (1. Yamagata Univ. , 2. Nagoya Univ, 3. JAEA, 4. Kumamoto Univ)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R6P-11] Petrography and Rb-Sr mineral age of mafic dyke rocks on Niban-Rock, Lützow-Holm Complex (LHC), East Antarctica.

*Tomoharu MIYAMOTO[1], Yamashita Katsuyuki[2], Daniel J. Dunkley[3], Toshiaki Tsunogae[4], Mutsumi Kato[5] (1. Kyushu University, 2. Okayama University, 3. Polish Academy of Sciences, 4. Univ. of Tsukuba, 5. Chiba University)

Compositional changes in closed and open systems of igneous rocks from northern part of Mt. Shaku-dake, northern Kyushu, SW Japan

*Keisuke ESHIMA[1]

1. Yamaguchi Univ.

Recently, diorite (HMD) with high Mg andesite (HMA) compositions have been reported from Cretaceous mafic rocks in northern Kyushu. Examples include the Kunisaki Peninsula, Kita-taku (Kamei et al., 2004), Mt. Shaku-dake and Mt. Ushikiri-yama areas (Eshima et al., 2020; Eshima, 2021; Eshima and Owada, 2023). These mantle-derived mafic magmas are considered to be strongly involved in the genesis of granitic magmas as parent magmas and heat sources for crustal melting (Reid et al., 1983), and are very important rocks for a comprehensive understanding of the magmatic relationships of the Cretaceous Northern Kyushu batholith and the growth process of the granitic crust. On the other hand, it is very important to examine the geological and petrological relationship between the HMA (HMD) and the surrounding rocks that were active at the same time to elucidate the origin of the HMA magma and its maturation process (including tectonics). Such an examination will expand our understanding of igneous activity with HMA activity to a comprehensive understanding that includes volcanic-plutonic activity and geological time scales. In this presentation, I discuss the compositional changes of igneous rocks including porphyritic rocks in the northern part of Mt. Shaku-dake area, Mt. Shaku-dake body is as known as the largest HMD body in northern Kyushu, in closed and open systems, and discuss the plutonism of the Cretaceous igneous activity in the early stage of the Cretaceous Northern Kyushu batholith.

Keywords: Cretaceous Northern Kyushu Batholith, Porphyry, Mixing, Hydrothermal alteration

Formation of upper-most crust in volcanic belt: Example for Cretaceous volcano–plutonic complex, Hyogo Prefecture, southwest Japan

*Masaaki OWADA[1], Shunsuke Fukuda[1], Atsushi Kamei[2]

1. Yamaguchi University, 2. Shimane University

A volcano–plutonic complex is an important magmatic body to understand for the formation of upper-most crustal processes in terms of its magmatic histories, geochronology, and geochemical investigations along volcanic belts. There are many volcano–plutonic complexes during the Cretaceous and Paleocene Tertiary in the southwest Japan. Cretaceous Volcanic tuff and welded tuff layers with 74 Ma by zircon Fission Track dating are underlain by Himeji City and Kakogawa City, Hyogo Prefecture, and are intruded by the Ohfuji-yama granodiorite (biotite K–Ar age, 77 Ma), andesitic dike, and quartz diorite dike. All intrusive rocks geochemically show tholeiitic compositions. Considering constituent rock types with their geochemical signatures, the volcano–plutonic complex in this area was situated in the volcanic front and formed an upper-most crust during the Late Cretaceous.

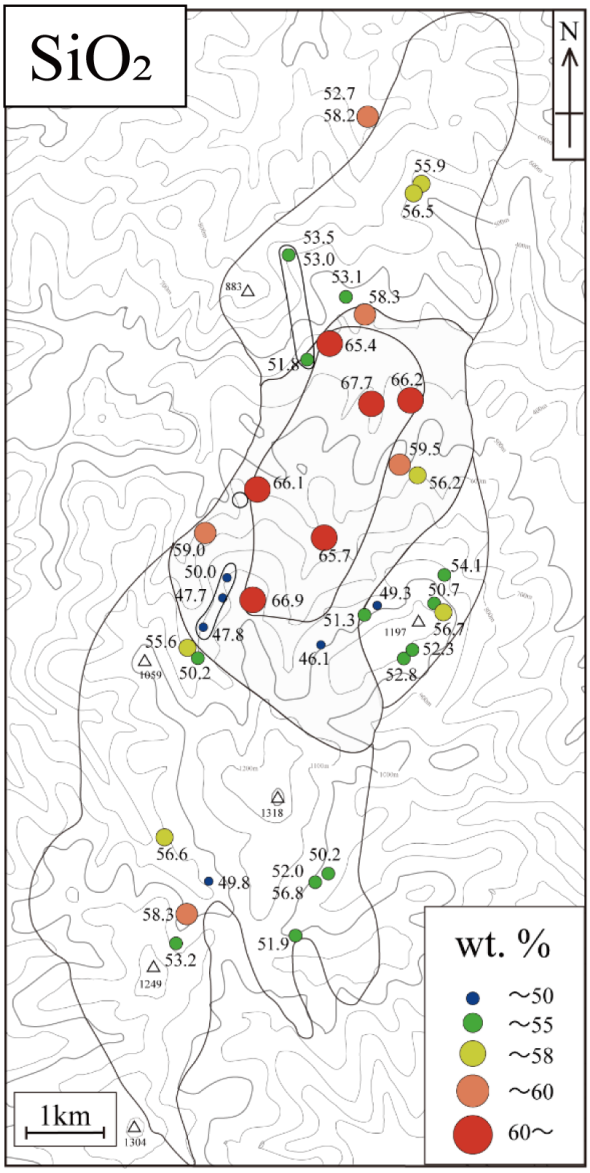
Keywords: Late Cretacous, Volcano-plutonic complex, volcanic front, Tholeiitic seriese

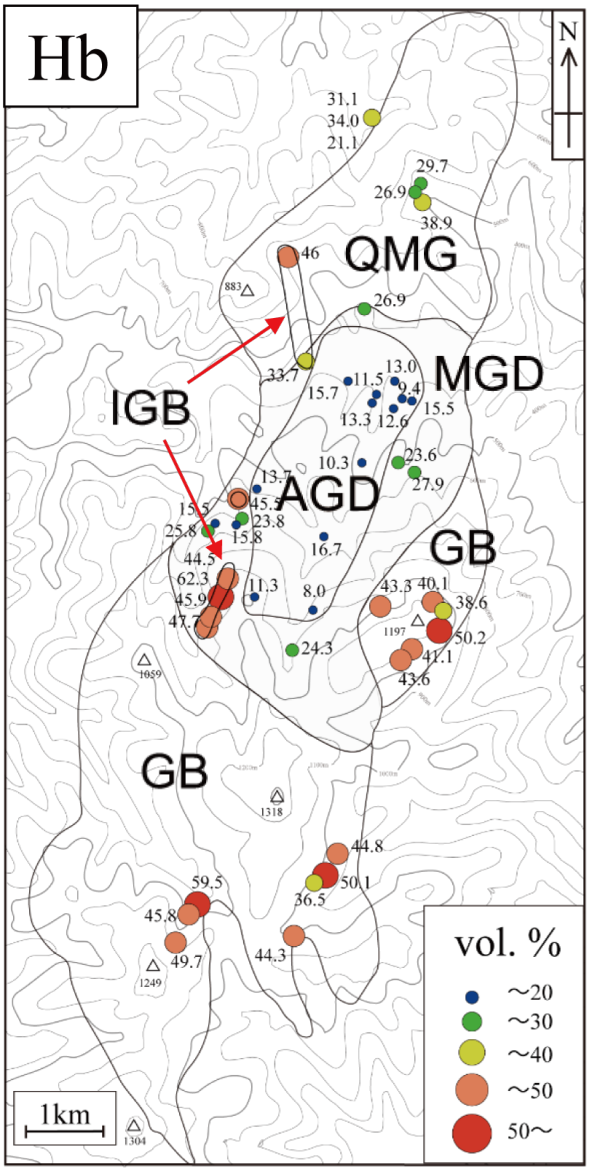
Intrusion and emplacement processes of adakitic magma into the shallow crust: A case study of the Sakainokami plutonic body, Kitakami mountains, northeast Japan

*Satoshi SUZUKI[1], Nobuo ASAI[1], Kazuo NAKASHIMA[1], Yasuhiro OGITA[2], Tatsunori YOKOYAMA[2], Shuhei SAKATA[3], Takeshi OHNO[4], Takashi YUGUCHI[5]

1. Yamagata Univ., 2. Japan Atomic Energy Agency, 3. Univ of Tokyo. , 4. Gakushuin Univ. , 5. Kumamoto Univ.

Keywords: flare-up, (non) adakitic magma, spatial petrographical characteristics , P-T history, t-T history





IGB	Intrusive gabbro
AGD	Adakitic biotite hornblende granodiorite
MGD	Biotite hornblende granodiorite
QMG	Biotite hornblende quratz monzodiorite - granodiorite
GB	Biotite two-pyroxene hornblende quartz gabbro

図１　堺ノ神岩体の全岩化学組成，モードによる空間的岩石学的特徴（左：全岩化学組成の SiO_2，右：ホルンブレンドのモード）

Identification of multiple components of noble gas isotopes in back-arc lithospheric mantle

*Lena Yokokura[1], Hirochika Sumino[1], Takeshi Kuritani[2], Yuuki Hagiwara[3], Junji Yamamoto[4]

1. The University of Tokyo, 2. Hokkaido University, 3. JAMSTEC, 4. Kyushu University

Keywords: Mantle xenolith, Fluid inclusions

Three-dimensional evaluation of internal structures contributing to mass transport distributed in minerals: micropores in K-feldspar in the Toki granite, central Japan.

*Mai Nonaka[1,2], Takashi Yuguchi[3]

1. Yamagata University, 2. Japan Atomic Energy Agency, 3. Kumamoto University

Keywords: Micropore, K-feldspar, mass transfer, Three-dimensional evaluation, Toki granite

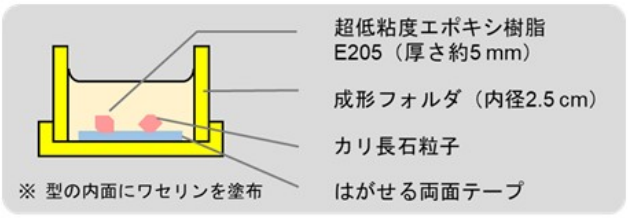


図1 作成試料の概念図

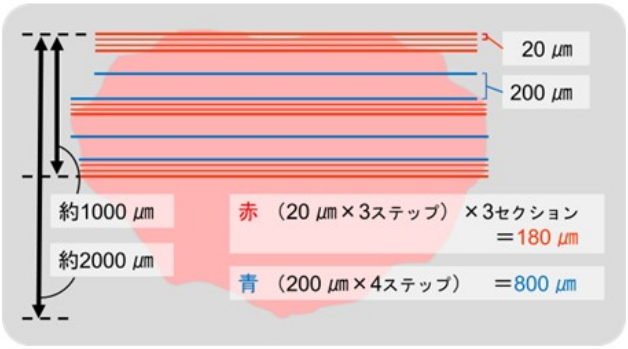


図2 試料研磨の概念図

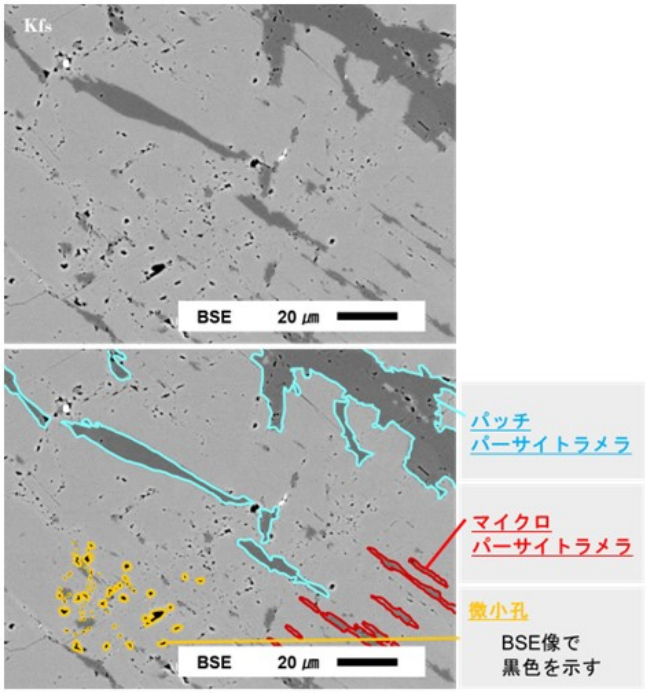


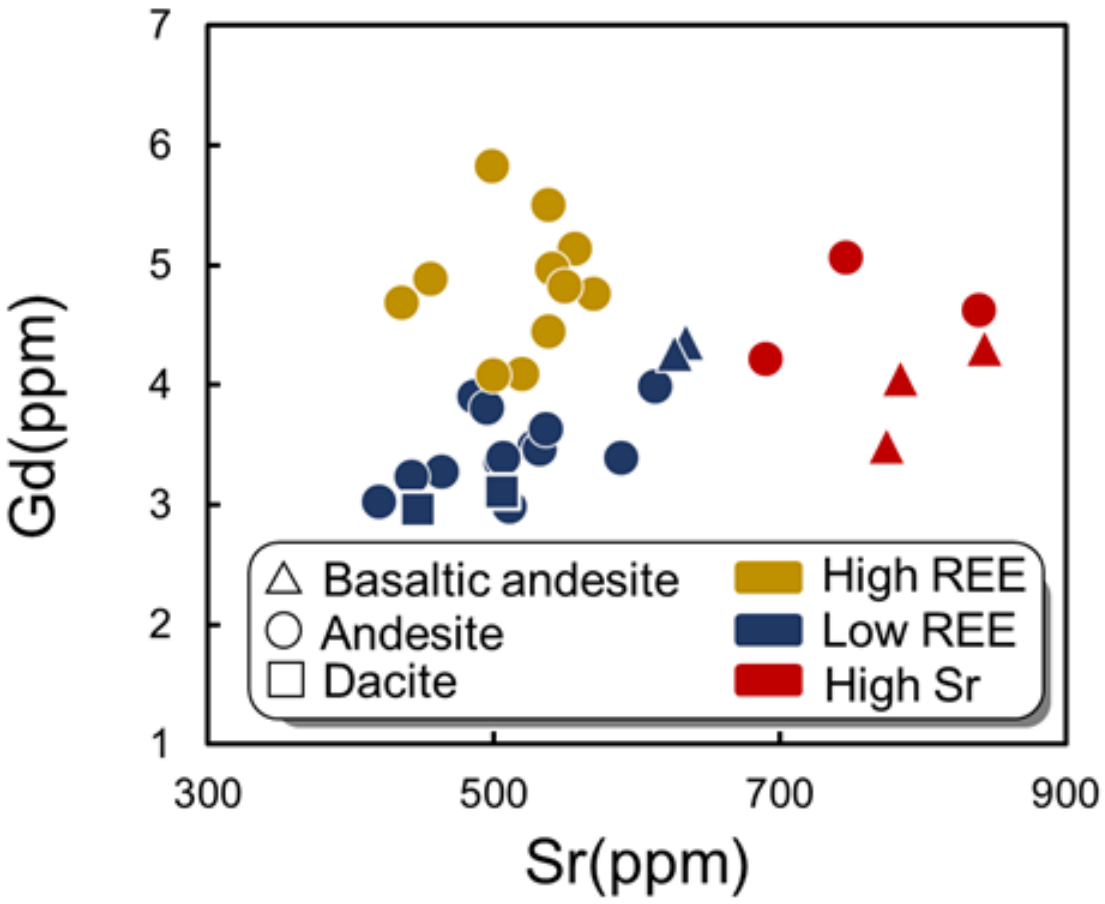
図3 SEM-CLで画像取得した
カリ長石の内部構造（BSE像）

Magma source and evolution process for Quaternary Magmas from Kuju Volcanoes, Kyushu Island, Southwest Japan Arc.

*Soma Yamanaka[1], Tomoyuki Shibata[3], Ryotaro Fujihara[1], Tatsuki Orito[1], Taichi Heijima[1], Masako Yoshikawa[3], Tomo Shibata[2]

1. Hiroshima Univ. Sci., 2. Fukuoka Univ. Sci., 3. Hiroshima Univ. Sci. & Tech.

Keywords: island arc, trace elements, Sr-Nd-Pb isotope, magma mixing, fractional crystallization



Geochemical features of the Early Miocene Hachiya Formation in the Chuno Area, Gifu Prefecture, Japan

*Seiya Saijou[1], Toshiro Takahashi[2]

1. Niigata Univ. Sci., 2. Niigata Univ

The Hachiya Formation in Chuno area, Gifu Prefecture, is composed of pyroclastic rocks of the Early Miocene, is seen on the front arc side of the volcanic front at that time. However, detailed Geochemical studies of this have not been done. We studied this to understand the igneous activity in southwest Japan at that time. This shows that this formation may have originated in slab melts that reacted with the mantle, continental lithospheres.

Keywords: Hachiya Formation, adakite, slab melting

Cathodoluminescence pattern of quartz and quantitative determination of titanium and aluminum concentration within quartz crystals in the Tono plutonic complex, Kitakami mountains

*Yasuhiro OGITA[1,2], Takenri KATO[3], Takashi YUGUCHI[4]

1. Yamagata Univ., 2. JAEA, 3. Nagoya Univ., 4. Kumamoto Univ.

Keywords: Quartz, cathodoluminescence pattern, titanium concentration, aluminum concentration, Tono plutonic complex

Cathodoluminescence patterns of quartz crystals in granite and their titanium concentrations: implication to crystallization process of quartz in the magma chamber

*Asuka Kato[1], Takenori Kato[2], Yasuhiro Ogita[1,3], Takashi Yuguchi[4], Eiji Sasao[3]

1. Yamagata Univ. , 2. Nagoya Univ, 3. JAEA, 4. Kumamoto Univ

Keywords: Quartz, Cathodoluminescence, EPMA, Titanium cocentration, TitaniQ thermometry

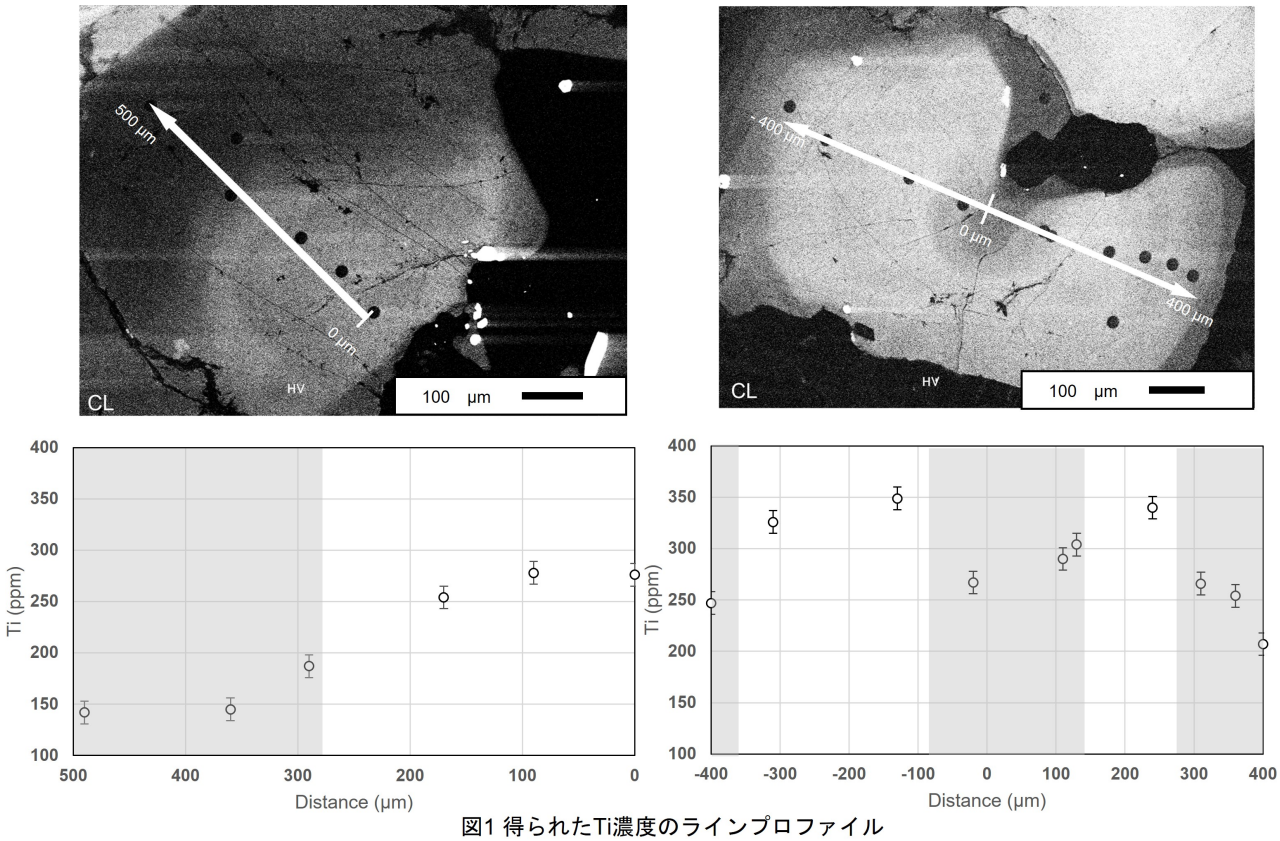


図1 得られたTi濃度のラインプロファイル

Petrography and Rb-Sr mineral age of mafic dyke rocks on Niban-Rock, Lützow-Holm Complex (LHC), East Antarctica.

*Tomoharu MIYAMOTO[1], Yamashita Katsuyuki[2], Daniel J. Dunkley[3], Toshiaki Tsunogae[4], Mutsumi Kato[5]

1. Kyushu University, 2. Okayama University, 3. Polish Academy of Sciences, 4. Univ. of Tsukuba, 5. Chiba University

Niban Rock is a 2.5 km ×3.5 km exposure located at northeast LHC and is corresponded into the amphibolite–facies zone. Niban Rock is composed of Niban–higashi Rock and Niban–nishi Rock, and is underlain mainly by sillimanite–garnet–biotite gneiss, biotite gneiss, and biotite–hornblende gneiss along with minor metabasite, calc–silicate gneiss, granite, and aplite. Although the intrusive rocks were less voluminous than the widespread metamorphic rocks, the emplacement of the mafic dyke which cut metamorphic textures and structures was recognized in the Niban-higashi Rock. The mafic dyke was a few tens cm width intrusive to 10 m length at least, oriented mostly to the WNW-ESE direction, and cut sharply through the foliage of the surrounding host gneisses. The dyke does not exhibit textures resembling the major metamorphic structures found in the surrounding basement rocks. The boundary between the dyke and surrounding host gneisses had no reactive textures. The mafic dyke rocks are commonly holocrystalline and aphyric. They consisted mainly of alkali feldspar, plagioclase, biotite, hornblende, quartz, apatite, and titanite. The crystals often grow in parallel arrays in the intrusive direction of the dyke. The mafic dyke rocks have alkalic compositions, and enriched to incompatible elements. For chronological research, the mafic fractions and felsic fractions were separated from crushed mafic rock samples. Their $^{87}Rb/^{86}Sr$ and $^{87}Sr/^{86}Sr$ values are aligned on the isochron diagram, and the age showed 500.9 ±0.2 Ma and IR = 0.704665 ±0.000016). Occurrence of the mafic dykes at Niban-Rock suggest the presence and timing of mantle-involved igneous activity after major metamorphism at the NE LHC.

Keywords: Lützow-Holm Complex, Mafic dyke, Intrusion of after peak metamorphism

Poster presentation | R8: Metamorphic rocks and tectonics

Sat. Sep 16, 2023 12:00 PM - 2:00 PM JST | Sat. Sep 16, 2023 3:00 AM - 5:00 AM UTC | 83G,H,J Sugimoto Campus

R8: Metamorphic rocks and tectonics

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-01] Structural and petrological study of layering in the Horoman Peridotite Complex, Hokkaido, Japan

[Presentation award entry]

*Aya Hihara[1], Miki Tasaka[1], Keisuke Kurihara[1], Tatsuhiko Kawamoto[1], Hajime Taniuchi[2] (1. Shizuoka University, 2. National Institute of Advanced Industrial Science and Technology)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-02] Geology and petrography of metamorphic rocks in Sibuyan Island, Romblon, Philippines

[Presentation award entry]

*John Kenneth Badillo[1], Gabriel Theophilus Valera[1], Betchaida Payot[1] (1. University of the Philippines Diliman)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-03] **The metamorphic condition of the Oshima peninsula, in the southern part of Yamaguchi prefecture: Implications for metamorphic process and regional structure of the Ryoke metamorphic belt, west Seto Inland sea area**

[Presentation award entry]

*Zejin LU[1], Masaaki Owada[1] (1. Yamaguchi University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-04] Study of flexural slip formed by plate subduction

[Presentation award entry]

*Haruki Yoshiasa[1], Jun-ichi ANDO[2], SARKAR Dyuti Prakash[2], DAS Kaushik[2], GHOSH Gautam[3] (1. Hiroshima Univ. , 2. Hiroshima Univ., 3. Presidency Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-05] Electron diffuse scattering in omphacite from lawsonite eclogite xenolith in Colorado Plateau: A preliminary report

[Presentation award entry]

*Ryo Fukushima[1], Tatsuki Tsujimori[1,2], Nobuyoshi Miyajima[3], Tiziana Boffa-Ballaran[3], Giacomo Criniti[3], Catherine McCammon[3] (1. Tohoku Univ. Sci., 2. CNEAS, Tohoku Univ., 3. BGI, Univ. Bayreuth)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-06] **Exhumation process of serpentinite in the Sangun-Renge belt exposed at Sasaguri, Fukuoka prefecture**

[Presentation award entry]

*Swarnaa ANNADURAI MUNUSAMY[1], Jun-ichi ANDO[1,2], Yuki IWASAKI[3], Dyuti Prakash SARKAR[1,2], Kaushik DAS[1,2], Seiichiro UEHARA[4] (1. Hiroshima Univ., 2. HiPeR, Hiroshima, 3. NIPPON STEEL CORP., 4. The Kyushu Univ. Museum)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-07] Mineral and bulk compositions of an outcrop showing a symmetric sequence composed of peridotite and mafic-rock layers of Horoman peridotite, Japan

[Presentation award entry]

*Keisuke Kurihara[1], Tatsuhiko Kawamoto[1], Aya Hihara[1], Miki Tasaka[1], Hajime Taniuchi[2], Takeshi Kuritani[3], Akiko Matsumoto[3] (1. Shizuoka Univ., 2. AIST, 3. Hokkaido Univ.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-08] Mechanism of seismic fault generation involving in pseudotachylyte formation in ductile regime: examples from Sarwar-Junia Fault Zone, India

[Presentation award entry]

*Junya OKAZAKI[1], Jun-ichi Ando[1], Kaushik Das[1] (1. Hiroshima University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-09] Water content distributions in dynamically recrystallized quartz grains in granitoid mylonites: A case of an inner shear zone in the Ryoke Belt in the Kishiwada area, Osaka

*Takemasa Norimura[1], Junichi Fukuda[1] (1. Osaka Metrop. Univ. Geosci.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-10] **Deformation microstructures and slip systems developed in olivine from the Petit-spot peridotite xenoliths: Insights on deformation mechanisms and anisotropy of upper mantle**

*Dyuti Prakash SARKAR[1,2], Norikatsu Akizawa[3], Jun-ichi Ando[1,2], Masako Yoshikawa[1,2] (1. Hiroshima University, 2. HiPeR, 3. The University of Tokyo)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-11] Novel automated method for estimating the peak temperature from the crystallinity of carbonaceous material using EM algorithm

*Yoshihiro NAKAMURA[1], Tarojiro MATSUMURA[1], Kazuhiro MIYAZAKI[1] (1. AIST)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-12] Zircon U-Pb ages of the Oura igneous complex, northern Kyoto area, SW Japan and its tectonic correlation

*Kosuke KIMURA[1], Kenta Kawaguchi[2], Nobuhiko Nakano[2], Tatsuro Adachi[2], Kaushik Das[3] (1. Osaka Metropolitan Univ. Sci., 2. Kyushu Univ. , 3. Hiroshima Univ. Sci.)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-13] Metasomatic syenite at the interface between charnockite and calc-silicate granulite, Eastern Ghats Belt, India: Mineral-chemical characterization and its implications during orogenesis

*Kaushik DAS[1,4], Proloy Ganguly[2], Sankar Bose[3,4] (1. Hiroshima University, 2. Durgapur Government College, Department of Geology, Durgapur, India, 3. Presidency University, Kolkata, India, 4. HiPeR, Hiroshima)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-14] Petrography of V and Zn-rich gahnite-sillimanite-muscovite gneiss from Menipa, Sør Rondane Mountains, East Antarctica

*Tatsuro ADACHI[1], Tetsuo Kawakami[2], Fumiko Higashino[2], Masaoki Uno[3] (1. Kyushu University, 2. Kyoto University, 3. Tohoku University)

12:00 PM - 2:00 PM JST | 3:00 AM - 5:00 AM UTC

[R8P-15] Unraveling the Link Between Deformation, Metamorphism, and Fluid Flow in the Archean Dharwar Craton, Southern India

*Sreehari LAKSHMANAN[1], Kiran Sasidharan[2], Satish-Kumar Madusoodhan[2], Tsuyoshi Toyoshima[2] (1. Shimane Uni., 2. Niigata Uni.)

Structural and petrological study of layering in the Horoman Peridotite Complex, Hokkaido, Japan

*Aya Hihara[1], Miki Tasaka[1], Keisuke Kurihara[1], Tatsuhiko Kawamoto[1], Hajime Taniuchi[2]

1. Shizuoka University, 2. National Institute of Advanced Industrial Science and Technology

Keywords: mantle, peridotite, Horoman Peridotite, deformation, crystallographic preferred orientation

Geology and petrography of metamorphic rocks in Sibuyan Island, Romblon, Philippines

*John Kenneth Badillo[1], Gabriel Theophilus Valera[1], Betchaida Payot[1]

1. University of the Philippines Diliman

Metamorphic rocks have been identified on Tablas, Romblon, and Sibuyan in the Romblon Island Group (RIG), Philippines. Collectively termed Romblon Metamorphics, these consist primarily of schists and phyllites, which are attributed by earlier works to the collision of the Palawan Microcontinental Block (PCB) and the Philippine Mobile Belt (PMB). In this work, we present new field and petrological data from metamorphic rocks exposed in Sibuyan Island to provide new insights into their petrogenesis and the *P-T-D* conditions that they preserve.

Phyllite outcrops of alternating quartz-rich (psammitic) and biotite-rich (pelitic) rocks are observed in northern Sibuyan island. The foliation direction of these interlayers generally dip in the southeast direction. Schist exposures on the other hand are more predominant in eastern and southwestern Sibuyan. They are also comprised of alternating dark- and light-colored layers suggesting similar protolith to the phyllites but with distinct peak metamorphic conditions. One outcrop documented near the coast in Barangay Mabini shows dark-colored schists with white prismatic feldspar porphyroblasts. This rock type dominates the exposure and is cut by dioritic leucocratic dikes that are often subparallel to the foliation of the schists.

Initial petrographic analysis of the metapelite schist and dike samples from Mabini revealed similar mineral assemblage of quartz(Qz)-feldspar(Afs)-biotite(Bt)-muscovite(Ms)-chlorite in varying abundances. Bt and Ms are the dominant minerals in schists, while Qz and Afs are more abundant in the dike samples. Foliations are observed as the preferred orientation of Qz and Afs in dikes and Bt and Ms in schist.

The dominance of Ms and Qz suggests a continent-derived protolith possibly linked to the PCB. Further petrological and geochemical analyses will be done to interpret the pressure-temperature-deformation-time (*P-T-D-t*) history and petrogenesis of rocks in the Sibuyan Island.

Keywords: schists, phyllites, Sibuyan, Romblon Island Group

The metamorphic condition of the Oshima peninsula, in the southern part of Yamaguchi prefecture: Implications for metamorphic process and regional structure of the Ryoke metamorphic belt, west Seto Inland sea area

*Zejin LU[1], Masaaki Owada[1]

1. Yamaguchi University

Keywords: High-temperature/Low-pressure type, Ryoke belt

Study of flexural slip formed by plate subduction

*Haruki Yoshiasa[1], Jun-ichi ANDO[2], SARKAR Dyuti Prakash[2], DAS Kaushik[2], GHOSH Gautam[3]

1. Hiroshima Univ. , 2. Hiroshima Univ., 3. Presidency Univ.

Keywords: Flexure slip, MBT, Microstructure observation, Dislocation creep, Frictional heating

Electron diffuse scattering in omphacite from lawsonite eclogite xenolith in Colorado Plateau: A preliminary report

*Ryo Fukushima[1], Tatsuki Tsujimori[1,2], Nobuyoshi Miyajima[3], Tiziana Boffa-Ballaran[3], Giacomo Criniti[3], Catherine McCammon[3]

1. Tohoku Univ. Sci., 2. CNEAS, Tohoku Univ., 3. BGI, Univ. Bayreuth

Ultrahigh-pressure lawsonite eclogite xenolith from the Navajo volcanic field, central Colorado Plateau, has attracted much attention because this xenolith should be a fragment of the Farallon plate that was rapidly brought to the surface by the diatreme formation. One can therefore expect that reconnaissance of its constituting minerals is useful to examine eclogitization processes without affected by retrogression. Notably, cation ordering processes in omphacite lead to various types of micrometer-scale textures such as antiphase domains, reflecting the thermal history of slab eclogitization.

Here, we report the crystallographic features of omphacite in the lawsonite eclogite xenolith. The omphacite grains are a little enriched in Fe^{3+}(~aug_{35-45} jd_{40-50} aeg_{15-20}) and characterized by local compositional heterogeneities. Despite the peak metamorphic temperature of ~620℃, below the critical temperature of its order-disorder transition (~865℃), our X-ray diffraction analysis of representative crystals demonstrated the absence of any super-lattice diffraction peaks belonging to the ordered phase. However, our observation of the omphacite from the same eclogite with transmission electron microscopy revealed the presence of diffuse scattering related to the ordered structure, although antiphase domains were not observed.

These omphacites should have undergone incomplete disordering after the prograde metamorphism. The most probable event that induced cation disordering was the Cenozoic thermal pulse before the diatreme emplacement. A previous study on a dunite xenolith suggested the presence of pre-emplacement heating (>~800℃) that lasted for <~1700 years (Smith, 2010). Therefore, we conducted several high-pressure annealing experiments of natural ordered omphacites by using a piston-cylinder apparatus; we obtained completely disordered omphacites after 24 h annealing at 1000℃, 3 GPa. This corroborates the hypothesis that cation disordering in omphacite can occur within such a short timescale. Although the heating might have overprinted the prograde omphacite microtexture, these peculiar omphacites could allow to discuss short timescale of the episodic heating, which cannot be evaluated only with conventional analyses of macroscopic diffusion profiles.

Keywords: omphacite, order-disorder transition, Colorado Plateau, lawsonite eclogite, electron diffuse scattering

Exhumation process of serpentinite in the Sangun-Renge belt exposed at Sasaguri, Fukuoka prefecture

*Swarnaa ANNADURAI MUNUSAMY[1], Jun-ichi ANDO[1,2], Yuki IWASAKI[3], Dyuti Prakash SARKAR[1,2], Kaushik DAS[1,2], Seiichiro UEHARA[4]

1. Hiroshima Univ., 2. HiPeR, Hiroshima, 3. NIPPON STEEL CORP., 4. The Kyushu Univ. Museum

Antigorite serpentinite (serp) of the Sangun-Renge Belt is exposed at the northern part of Narubuchi Dam, Sasaguri, Fukuoka Pref. Clarifying the exhumation process of serp is important for elucidating tectonics in mantle wedges. For this purpose, we conducted a petrological study of the Sasaguri serp and the amphibolite exposed in contact with this serp. Field survey reveals a mylonitized zone and siliceous schist (ss) distributed in the serp mass. The strike and dip of both rocks are similar to the serp mass. The microstructures of the serp, ss, and amphibolite are observed by optical microscope and SEM, the composition of Cr-spinel in serp is measured by EPMA, and the CPO of antigorite (atg) and quartz in ss is determined by SEM-EBSD. The following are revealed. 1) Atg, a few mm in size, shows undulose extinction and dynamic recrystallization, but no CPO. 2) Atg in the mylonitized zone is less than 100 μm in size, with (001) and [010] oriented parallel to foliation and lineation, respectively. 3) The composition of Cr-spinel (Fig. 1) indicates that the source rock (peridotite) is of forearc origin. The ferritchromite rim suggests that the peridotite is re-equilibrated at greenschist to amphibolite temperatures. 4) Magnetite formed around the ferritchromite rim indicates that the serpentinization occurred after ferritchromization. 5) The source of ss is chert. 6) SS shows a porphyroclastic texture, with X max CPO of c-axis of porphyroclast and crossed girdle of neoclasts. Crossed girdle is known to form at 400-550˚C. 7) The CPO of neoclasts indicates the top-to-north shear sense, which implies that recrystallization occurred during exhumation. 8) The hornblende thermometry shows that the amphibolite is formed at 550-700˚C. 9) The kink band in the hornblende is metasomatized to actinolite, suggesting retrograde metamorphism at greenschist facies condition. Based on the above results, the exhumation process of Sasaguri serp will be discussed in our presentation.

Keywords: Exhumation, Serpentinization, Antigorite, Quartz, CPO

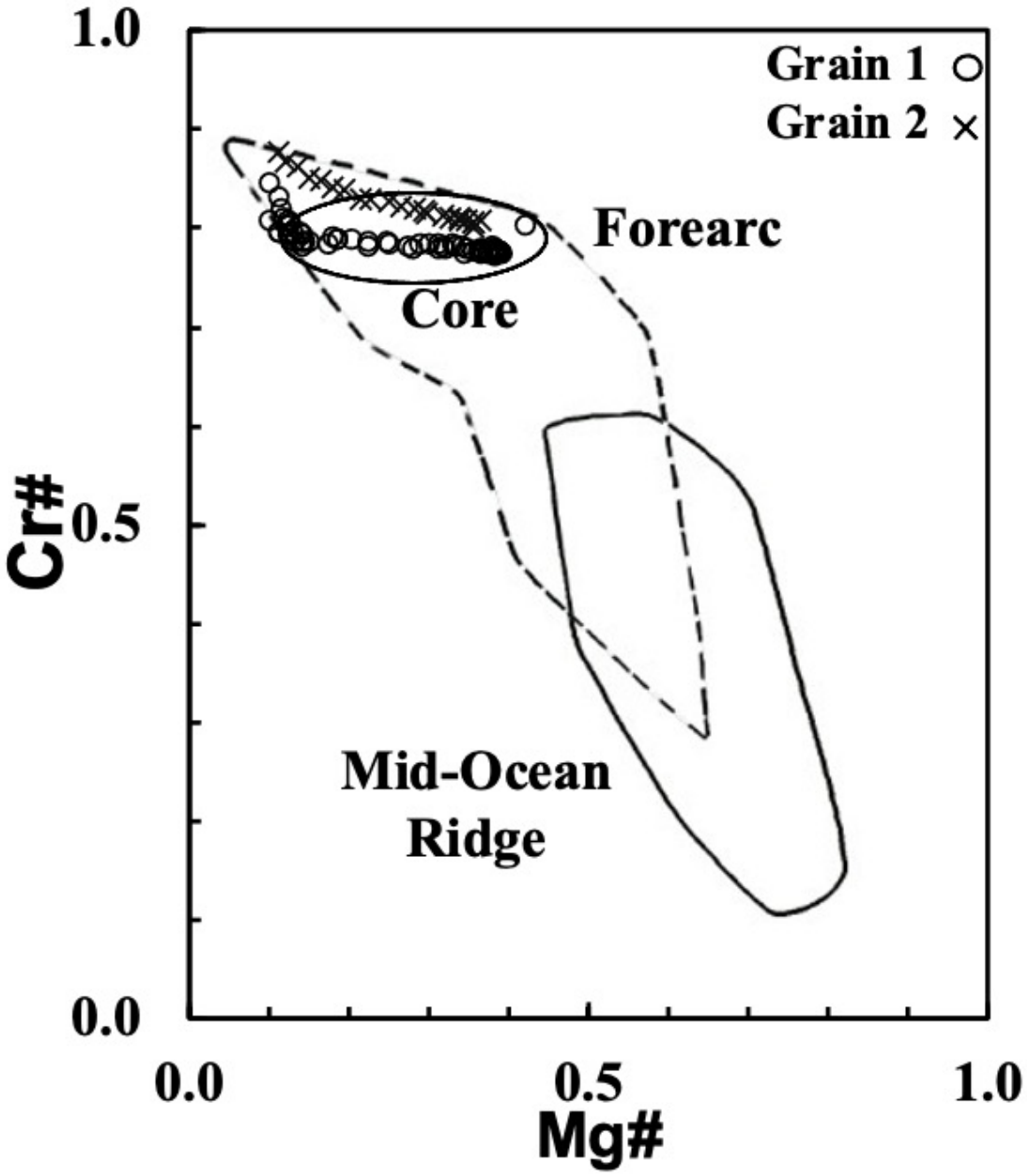


Fig. 1: Chemical composition of Cr-spinel along a line from the center to the rim for two grains. Mg# in the center is 0.3-0.4 and ferritchromatization is visible at the rim. Cr# = Cr/(Cr+Al), Mg# = Mg/(Mg+ Fe^{2+}). Modified from Morishita et al. (2013).

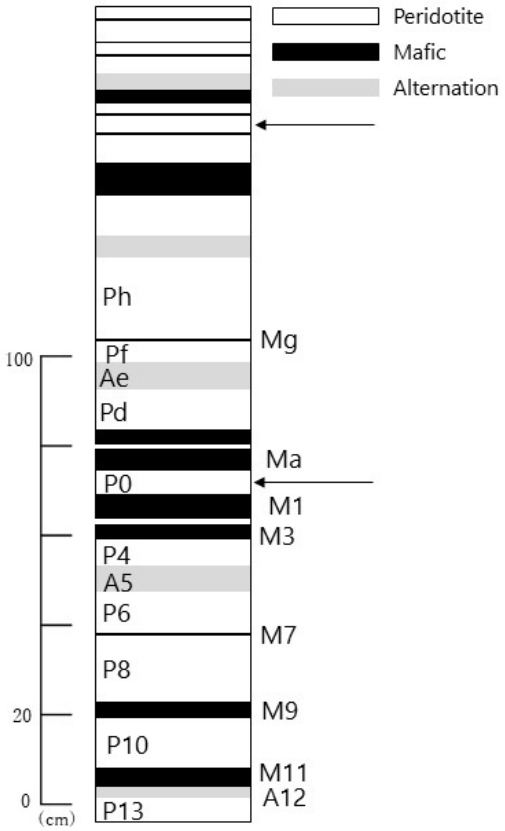
Mineral and bulk compositions of an outcrop showing a symmetric sequence composed of peridotite and mafic-rock layers of Horoman peridotite, Japan

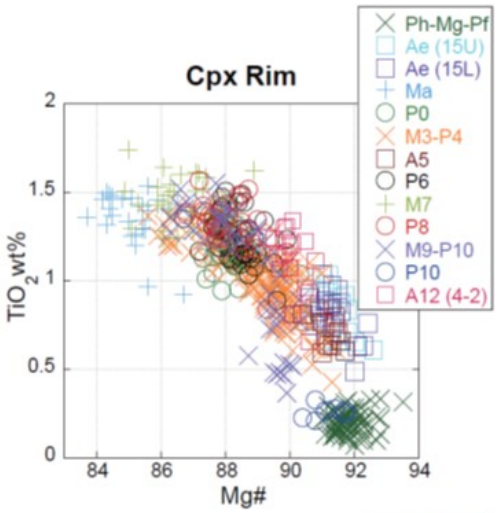
*Keisuke Kurihara[1], Tatsuhiko Kawamoto[1], Aya Hihara[1], Miki Tasaka[1], Hajime Taniuchi[2], Takeshi Kuritani[3], Akiko Matsumoto[3]

1. Shizuoka Univ., 2. AIST, 3. Hokkaido Univ.

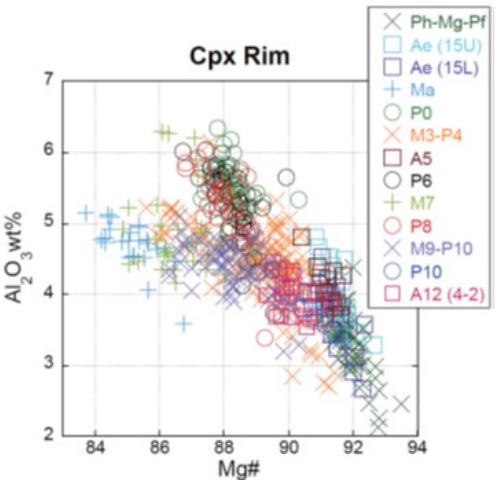
Keywords: Peridotite, Mafic-rock, Mantle, refertilization, Chemical composition

図A アポイ岳北尾根露頭の柱状図
矢印は対称構造の中心を指す。





図B
Cpx リムの
TiO_2 wt% vs Mg#



図C
Cpx リムの
Al_2O_3 wt% vs Mg#

Mechanism of seismic fault generation involving in pseudotachylyte formation in ductile regime: examples from Sarwar-Junia Fault Zone, India

*Junya OKAZAKI[1], Jun-ichi Ando[1], Kaushik Das[1]

1. Hiroshima University

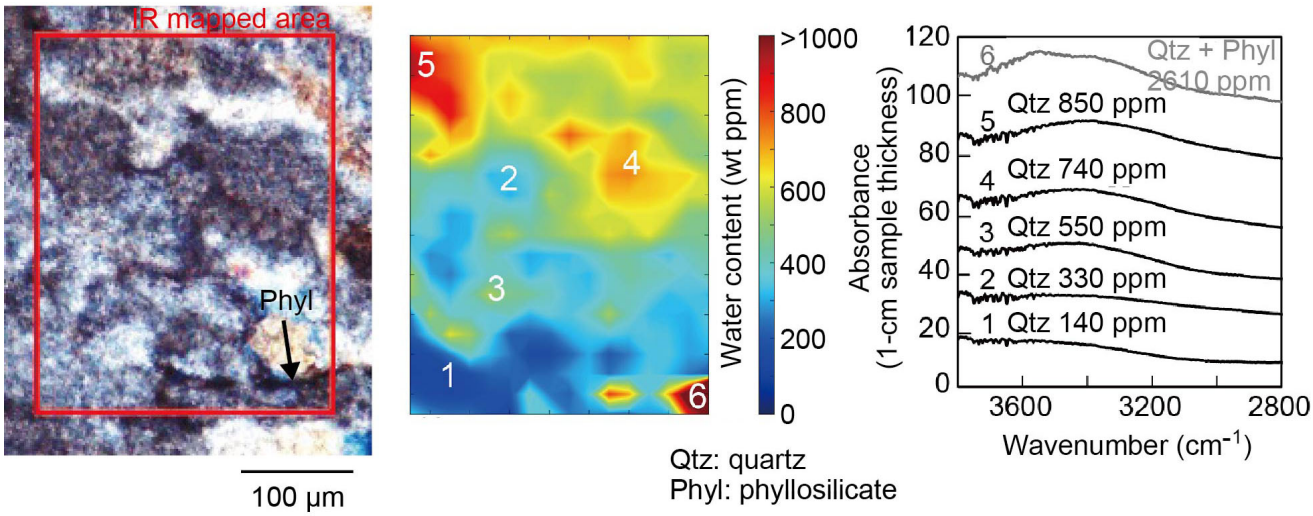
Keywords: Pseudotachylyte, Fault activity, Frictional melting, Ductile deformation zone

Water content distributions in dynamically recrystallized quartz grains in granitoid mylonites: A case of an inner shear zone in the Ryoke Belt in the Kishiwada area, Osaka

*Takemasa Norimura[1], Junichi Fukuda[1]

1. Osaka Metrop. Univ. Geosci.

Keywords: Quartz, Plastic deformation, Dynamic recrystallization, Water content, Infrared spectroscopy



Deformation microstructures and slip systems developed in olivine from the Petit-spot peridotite xenoliths: Insights on deformation mechanisms and anisotropy of upper mantle

*Dyuti Prakash SARKAR[1,2], Norikatsu Akizawa[3], Jun-ichi Ando[1,2], Masako Yoshikawa[1,2]

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Petit-spot is small knoll (~1 km^3 volume) occurring on the ocean floor and is considered to be formed as a result of plate flexure along outer rise. The presently studied peridotite xenoliths were obtained from petit-spot volcanic fields (Sites A and B) placed in the offshore of northern Japan during scientific cruises of YK20-14S and YK21-07S, using deep-submergence research vehicle Shinkai6500. The peridotite xenoliths are included in vesicular alkaline basalts. The peridotites are harzburgitic to lherzolitic in modal composition. The forsterite number (Mg/(Mg + Fe) atomic ratio ×100) of the olivine ranges from 91 to 92, and the pyroxenes are enstatite or diopside in composition. The olivines show minor reaction only in the boundaries with the host basalt, suggesting the preservation of pristine mantle microstructures. Additionally, the olivine grains show development of sub-grain boundaries, however distinct foliation and lineation are not prominently observed. Elucidating the deformation fabric of the olivine is a challenge as the individual xenoliths are unoriented and do not have distinct foliation or lineation. Hence to determine the active slip systems we have used Electron Backscatter Diffraction (EBSD) analysis to determine the slip system of individual sub-grain boundaries developed in each olivine grains for the samples and attempted to infer the overall slip system developed in the analyzed samples. We present these results and infer the possible deformation conditions for the peridotite xenoliths from the petit-spot volcanoes. Additionally, the results also provide us insights on the seismic anisotropy of the lithospheric mantle in the northwestern Pacific region.

Keywords: petit-spot, olivine deformation, mantle deformation, seismic anisotropy

Novel automated method for estimating the peak temperature from the crystallinity of carbonaceous material using EM algorithm

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1. AIST

Keywords: Carbonaceous material, Micro-Raman spectroscopy, EM algorithm

Zircon U-Pb ages of the Oura igneous complex, northern Kyoto area, SW Japan and its tectonic correlation

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Keywords: Oura igneous complex, Zircon, Yakuno ophiolite, Inner zone of Southwest Japan

Metasomatic syenite at the interface between charnockite and calc-silicate granulite, Eastern Ghats Belt, India: Mineral-chemical characterization and its implications during orogenesis

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We have recently found occurrences of meter-to-micrometer scale bands and veins of syenite at the contact between the calc-silicate granulite (clinopyroxene-plagioclase-scapolite-wollastonite-calcite-grandite garnet-titanite-apatite-quartz) and the coarse-grained charnockite (plagioclase-K-feldspar-orthopyroxene-quartz) exposed at the Phulbani area of the Proterozoic Eastern Ghats Province (EGP). The calc-silicate granulite witnessed ultrahigh temperature (UHT) metamorphism followed by charnockite intrusion. Syenite (clinopyroxene-K-feldspar-apatite±titanite±quartz) bands and mylonitized veins are roughly parallel to the axial plane of the mesoscopic-scale fold present in the calc-silicate granulite. Anorthitic patches, and myrmekite intergrowth replacing the albite component of plagioclase of the contact zone of charnockite are common. In charnockite, clinopyroxene and K-feldspar-bearing syenitic vein occurs which in turn replaces anorthitic plagioclase (An > 96 mol%) of calc-silicate granulite to scapolite+calcite bearing mineral assemblage. All these indicate a fluid-rock interaction while forming syenite.
During this deep crustal metasomatism, fluor-apatite overgrowths and neoblastic growths occurred in the syenite as well as the leached part of the wall rock. While the early-formed apatite grains are Ce, La, Y, and Si-enriched, the overgrowths are relatively depleted. The present study highlights the interactions of lower crustal rocks with saline, carbonic, and REE-depleted fluid. Similar metasomatic syenite occurrences are reported from other portions of the northern EGP implying its formation on a large scale during orogenic evolution.

Keywords: Syenite, Apatite, Trace elements, Metasomatism

Petrography of V and Zn-rich gahnite-sillimanite-muscovite gneiss from Menipa, Sør Rondane Mountains, East Antarctica

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Keywords: Vanadium, Zinc, metasedimentary rock, Sør Rondane Mountains, East Antarctica

Unraveling the Link Between Deformation, Metamorphism, and Fluid Flow in the Archean Dharwar Craton, Southern India

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The Dharwar Craton (DC) is the largest Archean(3500 to 2500 Ma) craton in the Indian Shield. The DC is divided into three main regions: the Western Dharwar Craton (WDC), the Central Dharwar Craton (CDC), and the Eastern Dharwar Craton (EDC). In this presentation, we aim to discuss the metamorphic history of the WDC and its interplay with deformation and fluid flow. We will present detailed petrological data from the eastern part of the WDC, specifically focusing on the southern section of the Chitradurga Schist Belt (CSB). The CSB consists of various rock formations, including the Sargur Group and Dharwar Supergroup. Through our detailed structural analysis, we have identified five major deformation events in the WDC. Among these, D2 (NNW-SSE trending reverse faults and upright folds) and D3 (strike-slip sinistral shear) are the regional-scale deformation events. Due to the limited availability of mineral assemblages suitable for geothermometry, we have employed carbonaceous material thermometry (CM) in metapelitic rocks from each formation. We have selected 15-samples containing CM from different Groups. Using Raman spectroscopy, we have identified differences in metamorphic temperatures among the Groups. The Bababudan and Chitradurga Groups exhibit metamorphic temperatures ranging from 500˚–550˚C, whereas the Hiriyur and Sargur Groups exhibit temperatures between 450˚– 400˚C. We interpret these differences in metamorphic temperatures as being associated with the spatial relation to the D_3 strike-slip shear zones within the study area. The fluid flow along these shear zones may have influenced the properties of the carbonaceous material, thereby affecting the observed temperatures. Additionally, based on the metamorphic mineral assemblage, the presence of Chlorite+Muscovite association is prominent in the D_3 shear zones, indicating fluid flow processes during the D_3 deformation. Moreover, microscopic observations reveal that Garnet-Biotite assemblages in the D2 shear zone are cross-cut by Fe-rich fluid veins, suggesting fluid flow processes following the D2 deformation. We interpret these fluid flow associated with the D3 deformation, which is directly connected to the regional-scale collision and associated strike-slip deformation processes that occurred throughout the entire DC.

Keywords: Dharwar Craton, Tectonics, Metamorphism, Deformation

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