Thu. Sep 12, 2024

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

10:00 AM - 12:00 PM JST | 1:00 AM - 3:00 AM UTC | ES Hall Higashiyama Campus

S1: Dynamics of igneous processes (Special Session)

Chairperson:Shumpei Yoshimura(Hokkaido University), Yuuki Hagiwara(Japan Agency for Marine-Earth Science and Technology), Morihisa Hamada(JAMSTEC)

10:00 AM - 10:20 AM JST | 1:00 AM - 1:20 AM UTC

[S1-01] Tungsten (VI) speciation in subduction-zone aqueous fluids and its significance for W stable isotope fractionation during slab dehydration

「招待講演」

*Naoko TAKAHASHI[1], Michihiko Nakamura[2], Shigeru Yamashita[3], Hiroyuki Kagi[1] (1. UTokyo Sci., 2. Tohoku Univ. Sci., 3. Okayama Univ. IPM)

10:20 AM - 10:40 AM JST | 1:20 AM - 1:40 AM UTC

[S1-02] Reconstruction of mantle structures using mantle xenoliths from Nushan, SE-edge of Sino-Korean craton: How far does the subduction fluid reach?

「招待講演」

*Yuto SATO[1], Eiichi Takahashi[2] (1. JAMSTEC Kochi, 2. GIG)

10:40 AM - 10:55 AM JST | 1:40 AM - 1:55 AM UTC

[S1-03] Elucidating Deep processes leading to maar eruptions using mantle xenoliths in the West Eifel volcanic field

「発表賞エントリー」

*Masanari Arao[1], Michihiko Nakamura[1], Mayumi Mujin[1], Naoki Araya[1], Sando Sawa[1], Takayuki Nakatani[2], Mari Sumita[3], Hans-Ulrich Schmincke[3] (1. Tohoku Univ.Sci., 2. AIST, 3. GEOMAR)

10:55 AM - 11:10 AM JST | 1:55 AM - 2:10 AM UTC

[S1-04] Water contents and pressures of melts in unerupted felsic magma constrained by SEM-EDS analysis of homogenized melt inclusions in zircon

「発表賞エントリー」

*Taichi Kawashima[1], Kazuya Shimooka[2], Toko Fukui[1], Satoshi Saito[1] (1. Ehime Univ., 2. Kwansei Gakuin Univ.)

11:10 AM - 11:25 AM JST | 2:10 AM - 2:25 AM UTC

[S1-05] Permeability and pore microstructures on the diktytaxitic texture of Ogurayama lava dome, Towada volcano

*Natsuko Sekiya[1], Michihiko Nakamura[2], Ryosuke Sakurai[3], Mayumi Mujin[2], Naoki Araya[2], Shingo Takeuchi[4], Yukiko Suwa[5] (1. Tohoku Univ. Sci., 2. Grad. Sch. of Sci., Tohoku Univ., 3. Univ. Tokyo, 4. CRIEPI, 5. CERES)

11:25 AM - 11:40 AM JST | 2:25 AM - 2:40 AM UTC

[S1-06] MD simulation of silicate melt and glass under tension deformation

*Ryota Mamizuka[1], Satoshi Okumura[1], Hiroshi Sakuma[2] (1. Tohoku Univ. Sci., 2. NIMS)

11:40 AM - 11:55 AM JST | 2:40 AM - 2:55 AM UTC

[S1-07] The magma plumbing system of Izu-Oshima Volcano: Constraints from the H_2O-saturated plagioclase liquidus

*Hidemi ISHIBASHI[1] (1. Shizuoka University)

Oral presentation | R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

10:00 AM - 12:00 PM JST | 1:00 AM - 3:00 AM UTC | ES024 Higashiyama Campus

R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

Chairperson:Masanori Kurosawa, Hiroshi Kitawaki

10:00 AM - 10:20 AM JST | 1:00 AM - 1:20 AM UTC

[R1-01] Determination of analytical conditions in quantitative electron probe microanalysis of ultra-trace elements: probe current and sampling time

「招待講演」

*Takenori KATO[1] (1. ISEE, Nagoya University)

10:20 AM - 10:35 AM JST | 1:20 AM - 1:35 AM UTC

[R1-02] Mössbauer Spectra and Intensity Tensors of Quadrupole Doublets for Fe^{3+} and Fe^{2+} of Bridgmanite

*Keiji SHINODA[1], Yasuhiro Kobayashi[2], Takuo Okuchi[2] (1. Osaka Met. Univ. Sci, 2. KURNS)

10:35 AM - 10:50 AM JST | 1:35 AM - 1:50 AM UTC

[R1-03] Clay mineral characterization by Optical Photothermal Induced Resonance (O-PTIR)

「発表賞エントリー」

*Taro Kido[1], Yohey Suzuki[1] (1. The University of Tokyo)

10:50 AM - 11:05 AM JST | 1:50 AM - 2:05 AM UTC

[R1-04] Characterization and Identification of Synthetic Colored Diamonds for Jewelry Use

*Hiroshi KITAWAKI[1], Kentaro Emori[1], Mio Hisanaga[1], Masahiro Yamamoto[1] (1. Central Gem Laboratory)

11:05 AM - 11:15 AM JST | 2:05 AM - 2:15 AM UTC

[1Lecture-201-07-5add] 休憩

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

[R1-05] Blue Sapphire from Australia and its origin

*Kentaro Emori[1], Hiroshi Kitawaki[1] (1. Central Gem Laboratory)

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

[R1-06] Emerald origin characteristics and problems in origin determination

*Zhenghao Zhao[1], Hiroshi Kitawaki[1], Kentaro Emori[1] (1. Central Gem Laboratory)

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

[R1-07] Gem zircon and sapphire age dating and application of origin determination; A study from New England sapphire fields, New South Wales, Australia

*Ahmadjan ABDURIYIM[1] (1. Tokyo Gem Science LLC)

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

10:00 AM - 12:00 PM JST | 1:00 AM - 3:00 AM UTC | ES025 Higashiyama Campus

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

Chairperson:Takeshi Sakai(Ehime University), Ryosuke Sinmyo(Meiji University), Takayuki Ishii(Okayama University), Takaaki Kawazoe(Hiroshima University)

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

[R3-01] Pressure-induced polyamorphic transition in $CaAl_2O_4$ glass revealed by elastic wave velocity and X-ray diffraction measurements and molecular dynamics simulations

「招待講演」

*Itaru Ohira[1], Yoshio Kono[2,3], Steeve Gréaux[3], James W E Drewitt[4], Sandro Jahn[5], Fumiya Noritake[6], Koji Ohara[7,8], Satoshi Hiroi[7,8], Nozomi M Kondo[9], Rostislav Hrubiak[10], Yuji Higo[8], Noriyoshi Tsujino[8], Sho Kakizawa[8], Kiyofumi Nitta[8], Oki Sekizawa[8] (1. Gakushuin Univ. Sci., 2. Kwansei Gakuin Univ. Sci., 3. Ehime Univ. GRC, 4. U. Bristol Phys., 5. U. Cologne IGM, 6. U. Yamanashi Interdisciplinary Research, 7. Shimane Univ. Materials for Energy, 8. JASRI, 9. Okayama Univ. IPM, 10. ANL HPCAT)

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

[R3-02] Structural analysis of CO_2-bearing sodium silicate melts using molecular dynamics simulations and synchrotron radiation X-ray diffraction experiments

「発表賞エントリー」

*Shino HAYAFUNE[1], Yohei Onodera[2], Shinji Kohara[2], Haruki Ichikawa[3], Tatsuya Sakamaki[1], Kenichi Funakoshi[4], Akio Suzuki[1] (1. Tohoku Univ. Graduate School of Science., 2. NIMS, 3. Tohoku Univ. School of Science., 4. CROSS)

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

[R3-03] Possible presence of poirierite, a high-pressure phase of $(Mg,Fe)_2SiO_4$, in the deep Earth's mantle

*Naotaka TOMIOKA[1], Takuo Okuchi[2], Narangoo Purevjav[3], Masaaki Miyahara[4] (1. KOCHI, JAMSTEC, 2. KRUNS, Kyoto Univ., 3. Seoul National Univ., 4. Earth Planet Sci., Hiroshima Univ.)

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

[R3-04] Temperature dependence of water content in wadsleyite and ringwoodite

*Toru INOUE[1,2], Yuji HAMADA[2], Hanae KAYA[2], Yusuke EGI[1], Daichi MAEDA[1], Kazutaka YAMAGUCHI[1], Konosuke YAMADA[1], Takaaki KAWAZOE[1,2] (1. Hiroshima Univ. Adv. Sci. Eng., 2. Hiroshima Univ. Sci.)

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

[R3-05] Temperature dependence of the $Fe^{3+}/\Sigma Fe$ ratio in wadsleyite by electron energy loss spectroscopy (EELS)

「発表賞エントリー」

*Kazutaka YAMAGUCHI[1], Takaaki Kawazoe[1], Toru Inoue[1], Naotaka Tomioka[2] (1. Hiroshima University, 2. JAMSTEC, Kochi institute)

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

[R3-06] Advantage on the analysis of cation site occupancies by neutron diffraction and some examples of application for high-pressure minerals

*Takuo OKUCHI[1] (1. Kyoto Univ.)

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

[R3-07] In situ lattice volume observation of davemaoite in the $CaSiO_3$-H_2O system up to uppermost lower mantle conditions

*Goru Takaichi[1], Takayuki Ishii[2], Yu Nishihara[1], Kyoko Matsukage[3], Yuji Higo[4], Noiyoshi Tsujino[4], Sho Kakizawa[4] (1. GRC, Ehime Univ., 2. IPM, Okayama Univ., 3. Teikyo University of Science, 4. JASRI)

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

[R3-08] Elasticity Measurements of Hydrous SiO_2 post-stishovite and its implication to the seismic anomalies in the lower mantle

「発表賞エントリー」

*Yuichiro MORI[1,2], Motohiko MURAKAMI[2], Takashi YOSHINO[3], Hiroyuki KAGI[1] (1. UTokyo. Sci., 2. ETHZ. D-ERDW., 3. Okayama Univ. IPM)

Oral presentation | R7: Petrology, Mineralogy and Economic geology (Joint Session with Society of Resource Geology)

2:00 PM - 5:30 PM JST | 5:00 AM - 8:30 AM UTC | ES Hall Higashiyama Campus

R7: Petrology, Mineralogy and Economic geology (Joint Session with Society of Resource Geology)

Chairperson:Norikatsu Akizawa(Atmosphere and Ocean Research Institute, University of Tokyo), Takuya Echigo(Akita University)

2:00 PM - 2:25 PM JST | 5:00 AM - 5:25 AM UTC

[R7-01] The Frontier of Ilmenite Geochronology Using the Uranium-Lead Decay System

「招待講演」

*Kengo Ito[1], Sota Niki[2], Tsuyoshi Iizuka[3], Takafumi Hirata[1] (1. The Univ. of Tokyo. GcRC, 2. Nagoya Univ. ISEE, 3. The Univ. of Tokyo. Sci. EPS)

2:25 PM - 2:40 PM JST | 5:25 AM - 5:40 AM UTC

[R7-02] Distribution of rhenium in hydrothermal deposits in Japan, based on LA-ICP-MS analysis

「発表賞エントリー」

*Mitsuki Ogasawara[1], Junichiro Ohta[1,2], Kazutaka Yasukawa[1], Kentaro Nakamura[2,1], Yasuhiro Kato[1,2] (1. Univ. Tokyo. Eng, 2. CIT. ORCeNG)

2:40 PM - 2:55 PM JST | 5:40 AM - 5:55 AM UTC

[R7-03] Occurrences of the PGE bearing (Fe,Ni,Co)AsS solid solution in the Bushveld Complex, South Africa

「発表賞エントリー」

*Sakuya Kubota[1], Takuya Echigo[1], Yasushi Watanabe[1] (1. Akita Univ. Irs.)

2:55 PM - 3:10 PM JST | 5:55 AM - 6:10 AM UTC

[R7-04] Shiranuiite and placer deposit of platinum group minerals, Haraigawa, Misato machi, Kumamoto Prefecture, Japan

*Daisuke HAMANE[1], Takahiro Tanaka, Tadashi Shinmachi (1. The University of Tokyo)

3:10 PM - 3:25 PM JST | 6:10 AM - 6:25 AM UTC

[R7-05] Geochmical and Sr-Nd isotopic characteristics of the Aitutaki peridotite xenoliths from the Cook islands

*Masako YOSHIKAWA[1], Norikatsu Akizawa[2] (1. Hiroshima Univ., 2. Tokyo Univ. AORI)

3:25 PM - 3:40 PM JST | 6:25 AM - 6:40 AM UTC

[R7-06] Hydration of the mantle and magma genesis in the Izu–Bonin-Mariana fore-arc

*Rion Yamaoka[1], Norikatsu Akizawa[1], Yuji Ichiyama[2], ToTomoaki Morishita[3], Akihiro Tamura[3], Hiroyuki Yamashita[4], Yumiko Harigane[5], Yasuhiko Ohara[6,7,8] (1. University of Tokyo, 2. Chiba Univ., 3. Kanazawa Univ., 4. Kanagawa Prefectural Museum of Natural History, 5. AIST, 6. Japan Coast Guard,Hydrographic and Oceanographic Department, 7. JAMSTEC, 8. Nagoya Univ.)

3:40 PM - 3:50 PM JST | 6:40 AM - 6:50 AM UTC

[1Lecture-108-19-7add] 休憩

3:50 PM - 4:15 PM JST | 6:50 AM - 7:15 AM UTC

[R7-07] Fault-rock mineralogy and weakening mechanisms at deep- to shallow-crustal depths of Main Himalayan Thrust, NW India

「招待講演」

*Dyuti Prakash SARKAR[1], Takehiro Hirose[1], Jun-ichi Ando[2], Kaushik Das[2], Gautam Ghosh[3] (1. Japan Agency for Marine-Earth Science and Technology (JAMSTEC), 2. Hiroshima University, 3. Presidency University)

4:15 PM - 4:30 PM JST | 7:15 AM - 7:30 AM UTC

[R7-08] On the Relationship between Phosphorus Concentration and Microstructure in Goethite in Australian Iron Ore

*Takashi MIKOUCHI[1], Reiko Murao[2], Toru Takayama[2] (1. Univ. Museum, Univ. of Tokyo, 2. Nippon Steel)

4:30 PM - 4:45 PM JST | 7:30 AM - 7:45 AM UTC

[R7-09] Mineral zoning and formation temperatures around the Myokenzan lithium pegmatites

「発表賞エントリー」

*Takumi Ishizaki[1], Takuya Echigo[1], Yasushi Watanabe[1] (1. Akita Univ.)

4:45 PM - 5:00 PM JST | 7:45 AM - 8:00 AM UTC

[R7-10] Copper as a Coloring Factor of Pale Blue Sepiolite in amygdales in Higashimatsuura basalt from Kabeshima, Saga Prefecture, SW Japan

「発表賞エントリー」

*Satsuki KIO[1], Terumi Ezima[2], Yoshiaki Kon[3], Hikari Minamisawa[4], Masaomi Horita[4] (1. Shinshu Univ. Sci., 2. Shinshu Univ. Sci. , 3. GSJ, AIST, 4. Shinshu Univ. Eng.)

5:00 PM - 5:15 PM JST | 8:00 AM - 8:15 AM UTC

[R7-11] Quantification of Mineral Modal and Zoning Ratios by Powder X-ray Diffraction: Advancing Towards Big Data Era

「発表賞エントリー」

*Satoshi MATSUNO[1], Shuhou Maitani[2], Kenta Yoshida[3], Nobuo Hirano[1], Ryosuke Sinmyo[2], Keiichi Osaka[4], Shin-ichi Yamasaki[1], Masaoki Uno[1], Atsushi Okamoto[1] (1. Tohoku University, 2. Meiji University, 3. JAMSTEC, 4. Japan Synchrotron Radiation Research Institute)

5:15 PM - 5:30 PM JST | 8:15 AM - 8:30 AM UTC

[R7-12] Searching for Dark Matter Using Geological Samples: Techniques and Preliminary Results

*Natsue ABE[1,2], Shigenobu Hirose[1], Qing CHANG[1], Takeshi Hanyu[1], Noriko Hasebe[2], Yasushi Hoshino[3], Takashi Kamiyama[4], Yoji Kawamura[1], Kohta Murase[5], Tatsuhiro Naka[6], Kenji Oguni[1], Katsuhiko Suzuki[1], Seiko Yamazaki[7] (1. JAMSTEC, 2. Kanazawa University, 3. Kanagawa University, 4. Hokkaido University, 5. Penn State University, 6. Toho University, 7. AIST)

Oral presentation | R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

2:00 PM - 3:15 PM JST | 5:00 AM - 6:15 AM UTC | ES024 Higashiyama Campus

R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

Chairperson:Koichi Momma, Yohei Shirose

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

[R1-08] Ultra nano inclusion in blue sapphire from Diego, Madagascar

*Akira MIYAKE[1], Seika Oto[1], Yohei Igami[1], Kentaro Emori[2] (1. Kyoto University, 2. CGL)

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

[R1-09] Reexamination of the symmetry of itoigawaite

*Chigako KIYOHARA, Yohei Igami[1], Akira Miyake[1], Norimasa Shimobayashi[1] (1. Kyoto Univ. Sci.)

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

[R1-10] Zeolite and altered boninite from Miyanohama, Ogasawara, Japan

*Yuki INOUE[1], Mana Yasui[2], Jun-ichiro Ishibashi[3], Hagiya Hiroshi[4], Kazuhiko Shimada[1], Athushi Yamazaki[2] (1. Kyushu Univ. Sci., 2. Waseda Univ. , 3. Kobe Univ., 4. Tokyo City Univ.)

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

[R1-11] Willemseite from the Hamayokawa mine, Nagano Prefecture, Japan

*Satoshi Matsubara[1], Koichi Momma[1], Norio Yanagisawa[2], Yoko Kusaba[1], Akiko Tokumoto[1], Ritsuro Miyawaki[1] (1. National Museum of Nature and Science, 2. Geological Survey of Japan, AIST)

3:00 PM - 3:15 PM JST | 6:00 AM - 6:15 AM UTC

[R1-12] On the Fe^{2+}-analogue of zemannite from Kawazu mine, Shizuoka Prefecture, Japan

*Koichi MOMMA[1], Owen Missen[2], Stuart Mills[3], Ritsuro Miyawaki[1], Satoshi Matsubara[1], Eiji Ohtani[4], Seiji Kamada[5], Shin Ozawa[4] (1. National Museum of Nature and Science, 2. University of Tasmania, 3. The Arkenstone, 4. Tohoku Univ., 5. AD Science Inc.)

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

2:00 PM - 3:15 PM JST | 5:00 AM - 6:15 AM UTC | ES025 Higashiyama Campus

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

Chairperson:Takeshi Sakai(Ehime University), Ryosuke Sinmyo(Meiji University), Takayuki Ishii(Okayama University), Takaaki Kawazoe(Hiroshima University)

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

[R3-09] Electrical conductivity of the lower mantle materials under high pressure with implication for valence and spin states of iron

「招待講演」

*Izumi MASHINO[1] (1. Okayama Univ.)

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

[R3-10] GHz-DAC ultrasonics to measure elastic anomaly with the spin transition of ferrous ion in ferropericlase

*Akira Yoneda[1], Izumi Mashino[2], Ryosuke Matsui[1], Ryoma Ishida[1], Tadashi Kondo[1] (1. Osaka Univ. Sci, 2. Okayama Univ. IPM)

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

[R3-11] Reaction between water and iron in the early magma ocean and the present core-mantle boundary

*Yongjae Lee[1] (1. Yonsei University)

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

[R3-12] Sound velocity of B2-FeNiSi alloy at high pressure and high temperature and constitution of the Earth's inner core

*Eiji OHTANI[1], Daijo IKUTA[2], Hiroshi FUKUI[3,4], Tatsuya SAKAMAKI[1], Daisuke Ishikawa[3,4], Alfred Q. R. BARON[3,4] (1. Tohoku University, 2. Institute for Planetary Materials, Okayama University, 3. JASRI, 4. RIKEN)

3:00 PM - 3:15 PM JST | 6:00 AM - 6:15 AM UTC

[R3-13] On the phase boundary between FeS IV and V

*Satoru URAKAWA[1] (1. Okayama University)

Oral presentation | R8: Metamorphic rocks and tectonics

3:30 PM - 6:00 PM JST | 6:30 AM - 9:00 AM UTC | ES024 Higashiyama Campus

R8: Metamorphic rocks and tectonics

Chairperson:Yui Kouketsu(Nagoya University), Shunsuke Endo

3:30 PM - 3:45 PM JST | 6:30 AM - 6:45 AM UTC

[R8-01] Toward the establishment of "EBSD method for the detection of quartz with phase transition to coesite": Incorporation of the Gongen area, Sanbagawa metamorphic belt, Shikoku, SW-Japan

「発表賞エントリー」

*Momoko Minowa[1], Takayoshi Nagaya[1], Taisuke Ito[2], Simon Wallis[2] (1. Tokyo Gakugei University, 2. The University of Tokyo)

3:45 PM - 4:00 PM JST | 6:45 AM - 7:00 AM UTC

[R8-02] Pressure-Temperature-Time Conditions of The Basement Rocks in The Banggai-Sula Microcontinent, Indonesia

「発表賞エントリー」

*Fransiska Ayuni Catur Wahyuandari[1], Nobuhiko Nakano[1], Tatsuro Adachi[1], Nugroho Imam Setiawan[2] (1. Kyushu Univ., 2. Gadjah Mada Univ.)

4:00 PM - 4:15 PM JST | 7:00 AM - 7:15 AM UTC

[R8-03] Amphibolites from the Mineoka belt revisited

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

4:15 PM - 4:30 PM JST | 7:15 AM - 7:30 AM UTC

[R8-04] Compositional heterogeneity of garnet in garnet-biotite felsic granulite, Czech Republic

*Daisuke NAKAMURA[1], Yuuka FUJIMURA[1], Yuuki KODERA[1] (1. Okayama University)

4:30 PM - 4:45 PM JST | 7:30 AM - 7:45 AM UTC

[R8-05] Formation and alteration of a zoned calcsilicate vein from the contact aureole of Kasuga area, central Japan: insights from chemical ages of U-Th oxides

*Shunsuke ENDO[1] (1. Shimane University)

4:45 PM - 5:00 PM JST | 7:45 AM - 8:00 AM UTC

[R8-06] Observations of geological structures and microstructures associated with strain release at a continental plate boundary fault

「発表賞エントリー」

*Haruki Yoshiasa[1], Jun-ichi Ando[1,2], Kaushik Das[1,2], Dyuti Prakash Sarkar[3] (1. Hiroshima University, 2. HiPeR, 3. JAMSTEC)

5:00 PM - 5:15 PM JST | 8:00 AM - 8:15 AM UTC

[R8-07] Comparison and verification study of new sample forms for use in Raman carbonaceous material geothermometer

「発表賞エントリー」

*Shunsuke Ogino[1], Yui Kouketsu[1], Satoshi Takahashi[1] (1. Nagoya Univ. Env.)

5:15 PM - 5:30 PM JST | 8:15 AM - 8:30 AM UTC

[R8-08] Pressure and temperature conditions for the occurrence of index minerals in pelitic schists in the Sanbagawa belt, Kanto Mountains, Japan, inferred from Raman carbonaceous material geothermometry

*Yui KOUKETSU[1], Ichiko Shimizu[2] (1. Nagoya Univ. Env., 2. Kyoto Univ. Sci.)

5:30 PM - 5:45 PM JST | 8:30 AM - 8:45 AM UTC

[R8-09] Microstructural and petrological characteristics of the Ryoke mylonite occurred along the Median Tectonic Line in the Shinshiro area, Aichi Prefecture

*Miharu Niwa[1,2], Katsuyoshi Michibayashi[1,3], Kenichiro Tani[4], Takuma Nishimura[5] (1. Nagoya Univ. Env., 2. TMNH, 3. JAMSTEC, 4. NMNS, 5. HMNH)

5:45 PM - 6:00 PM JST | 8:45 AM - 9:00 AM UTC

[R8-10] Re-proposal of the metamorphic zone division in the Horokanai area of the Kamuikotan Belt based on the mineral paragenesis and phengite K-Ar Age.

*Takao HIRAJIMA[1], Kousuke Naemura[2], Kenta Yoshida[3] (1. Kyoto University, 2. Iwate University, 3. JAMSTEC)

Oral presentation | S3: Rheology and Material Transfer in Mantle and Crust (Special Session)

3:30 PM - 6:00 PM JST | 6:30 AM - 9:00 AM UTC | ES025 Higashiyama Campus

S3: Rheology and Material Transfer in Mantle and Crust (Special Session)

Chairperson:Ikuo Katayama(Hiroshima University), Katsuyoshi Michibayashi(Nagoya University)

3:30 PM - 3:50 PM JST | 6:30 AM - 6:50 AM UTC

[S3-01] High-speed time-resolved in-situ stress-strain measurements under high pressure and high temperature using synchrotron radiation X-rays

「招待講演」

*Noriyosi TSUJINO[1] (1. JASRI)

3:50 PM - 4:05 PM JST | 6:50 AM - 7:05 AM UTC

[S3-02] Deformation-induced crystallographic-preferred orientation of ε-FeOOH

*Yu NISHIHARA[1], Yui MORI[1], Wentian WU[1], Noriyoshi TSUJINO[2] (1. GRC, Ehime Univ., 2. JASRI)

4:05 PM - 4:20 PM JST | 7:05 AM - 7:20 AM UTC

[S3-03] Strength of metastable olivine and the rheology of subducting cold slab at mantle transition zone

「発表賞エントリー」

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

4:20 PM - 4:40 PM JST | 7:20 AM - 7:40 AM UTC

[S3-04] High-resolution measurement of ice anelasticity over a broad frequency range with a new cryogenic forced oscillation apparatus

「招待講演」

*Hatsuki Yamauchi[1], Christine McCarthy[1], Benjamin Holtzman[1], David Goldsby[2], Travis Hager[2] (1. Columbia Univ. LDEO, 2. U. Penn)

4:40 PM - 4:55 PM JST | 7:40 AM - 7:55 AM UTC

[S3-05] Relationship between creep and grain growth in rock with bicontinuous structure

「発表賞エントリー」

*Shenghao Jiang[1], Takehiko Hiraga[1] (1. The University of Tokyo)

4:55 PM - 5:10 PM JST | 7:55 AM - 8:10 AM UTC

[S3-06] Microstructures of plagioclase in gabbroic ultramylonites and quadruple point analysis

*Itsuki Natsume[1], Katsuyoshi Michibayashi[2,3], Yohei Igami[4] (1. Kanagawa Prefectural Museum of Natural History, 2. Nagoya Univ., 3. JAMSTEC, 4. Kyoto Univ.)

5:10 PM - 5:25 PM JST | 8:10 AM - 8:25 AM UTC

[S3-07] Reconstruction of the uppermost mantle continuous structure of the Oman ophiolite

*Takeo Okuwaki[1], Natsume Itsuki[2], Katsuyoshi Michibayashi[1] (1. Nagoya Univ. Env, 2. Kanagawa Pref. Mus. Nat. Hist.)

5:25 PM - 5:40 PM JST | 8:25 AM - 8:40 AM UTC

[S3-08] Deformation and melt-rock interaction in the Horoman peridotite: Petrological and structual study of the MHL suite and BDH suite rocks

「発表賞エントリー」

*Aya Hihara[1], Miki Tasaka[1], Keisuke Kurihara[1], Hajime Taniuchi[2], Tastuhiko Kawamoto[1] (1. Shizuoka Univ., 2. AIST)

5:40 PM - 5:55 PM JST | 8:40 AM - 8:55 AM UTC

[S3-09] Multicomponent measurements of seismic velocity and electrical resistivity using foliated serpentinite and peridotite

「発表賞エントリー」

*Tomohiro Ito[1], Ikuo Katayama[1], Katsuyoshi Michibayashi[2], Kazuki Matsuyama[2] (1. Hiroshima University, 2. Nagoya University)

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

Thu. Sep 12, 2024 10:00 AM - 12:00 PM JST | Thu. Sep 12, 2024 1:00 AM - 3:00 AM UTC | ES Hall Higashiyama Campus

S1: Dynamics of igneous processes (Special Session)

Chairperson:Shumpei Yoshimura(Hokkaido University), Yuuki Hagiwara(Japan Agency for Marine-Earth Science and Technology), Morihisa Hamada(JAMSTEC)

10:00 AM - 10:20 AM JST | 1:00 AM - 1:20 AM UTC

[S1-01] Tungsten (VI) speciation in subduction-zone aqueous fluids and its significance for W stable isotope fractionation during slab dehydration

「招待講演」

*Naoko TAKAHASHI[1], Michihiko Nakamura[2], Shigeru Yamashita[3], Hiroyuki Kagi[1] (1. UTokyo Sci., 2. Tohoku Univ. Sci., 3. Okayama Univ. IPM)

10:20 AM - 10:40 AM JST | 1:20 AM - 1:40 AM UTC

[S1-02] Reconstruction of mantle structures using mantle xenoliths from Nushan, SE-edge of Sino-Korean craton: How far does the subduction fluid reach?

「招待講演」

*Yuto SATO[1], Eiichi Takahashi[2] (1. JAMSTEC Kochi, 2. GIG)

10:40 AM - 10:55 AM JST | 1:40 AM - 1:55 AM UTC

[S1-03] Elucidating Deep processes leading to maar eruptions using mantle xenoliths in the West Eifel volcanic field

「発表賞エントリー」

*Masanari Arao[1], Michihiko Nakamura[1], Mayumi Mujin[1], Naoki Araya[1], Sando Sawa[1], Takayuki Nakatani[2], Mari Sumita[3], Hans-Ulrich Schmincke[3] (1. Tohoku Univ.Sci., 2. AIST, 3. GEOMAR)

10:55 AM - 11:10 AM JST | 1:55 AM - 2:10 AM UTC

[S1-04] Water contents and pressures of melts in unerupted felsic magma constrained by SEM-EDS analysis of homogenized melt inclusions in zircon

「発表賞エントリー」

*Taichi Kawashima[1], Kazuya Shimooka[2], Toko Fukui[1], Satoshi Saito[1] (1. Ehime Univ., 2. Kwansei Gakuin Univ.)

11:10 AM - 11:25 AM JST | 2:10 AM - 2:25 AM UTC

[S1-05] Permeability and pore microstructures on the diktytaxitic texture of Ogurayama lava dome, Towada volcano

*Natsuko Sekiya[1], Michihiko Nakamura[2], Ryosuke Sakurai[3], Mayumi Mujin[2], Naoki Araya[2], Shingo Takeuchi[4], Yukiko Suwa[5] (1. Tohoku Univ. Sci., 2. Grad. Sch. of Sci., Tohoku Univ., 3. Univ. Tokyo, 4. CRIEPI, 5. CERES)

11:25 AM - 11:40 AM JST | 2:25 AM - 2:40 AM UTC

[S1-06] MD simulation of silicate melt and glass under tension deformation

*Ryota Mamizuka[1], Satoshi Okumura[1], Hiroshi Sakuma[2] (1. Tohoku Univ. Sci., 2. NIMS)

11:40 AM - 11:55 AM JST | 2:40 AM - 2:55 AM UTC

[S1-07] The magma plumbing system of Izu-Oshima Volcano: Constraints from the H_2O-saturated plagioclase liquidus

*Hidemi ISHIBASHI[1] (1. Shizuoka University)

11:55 AM - 12:00 PM JST | 2:55 AM - 3:00 AM UTC

調整

Tungsten (VI) speciation in subduction-zone aqueous fluids and its significance for W stable isotope fractionation during slab dehydration

*Naoko TAKAHASHI[1], Michihiko Nakamura[2], Shigeru Yamashita[3], Hiroyuki Kagi[1]

1. UTokyo Sci., 2. Tohoku Univ. Sci., 3. Okayama Univ. IPM

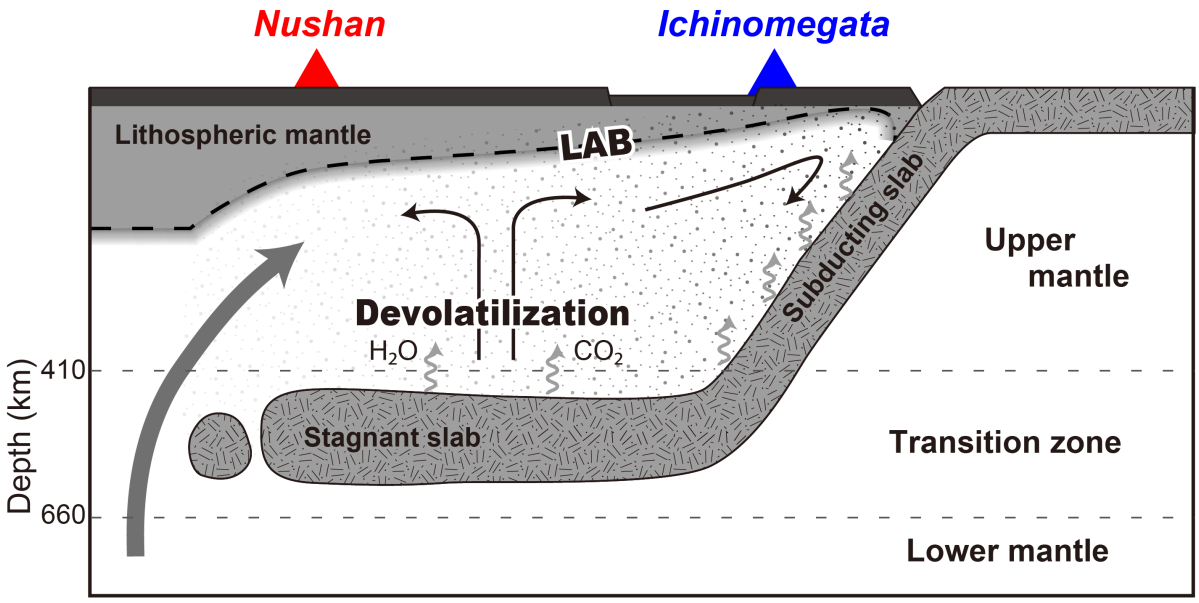
Keywords: Diamond anvil cell, In-situ Raman spectroscopy, Tungsten (VI) speciation, Subduction zone

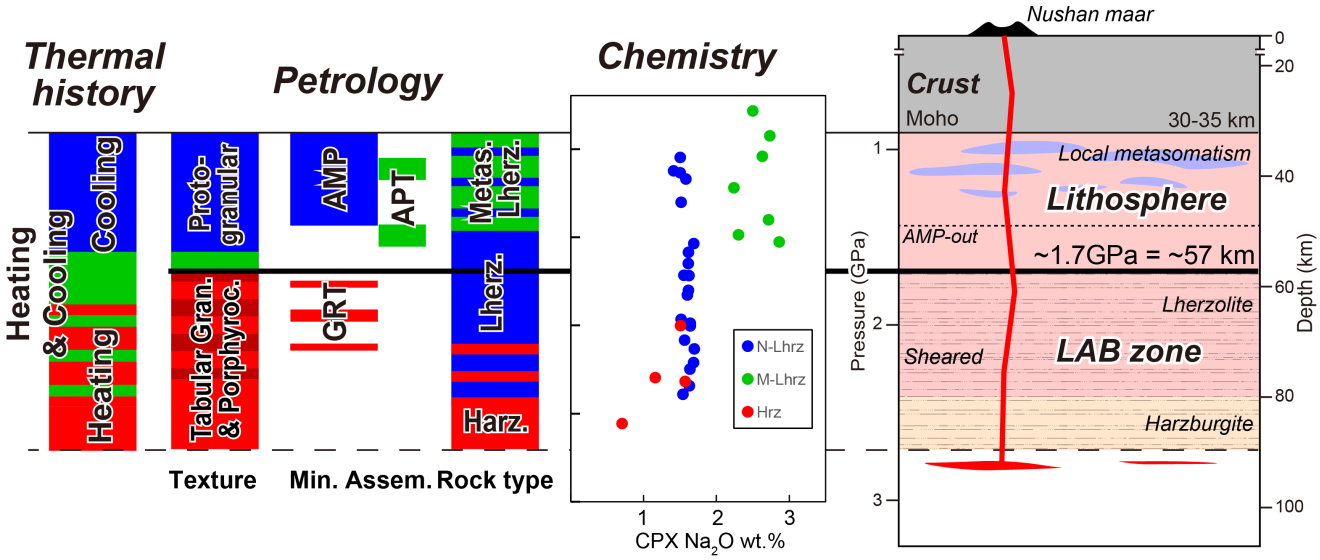
Reconstruction of mantle structures using mantle xenoliths from Nushan, SE-edge of Sino-Korean craton: How far does the subduction fluid reach?

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

1. JAMSTEC Kochi, 2. GIG

Keywords: Mantle xenolith, Big mantle wedge, NAMs, Mantle petrology, FTIR





Elucidating Deep processes leading to maar eruptions using mantle xenoliths in the West Eifel volcanic field

*Masanari Arao[1], Michihiko Nakamura[1], Mayumi Mujin[1], Naoki Araya[1], Sando Sawa[1], Takayuki Nakatani[2], Mari Sumita[3], Hans-Ulrich Schmincke[3]

1. Tohoku Univ.Sci., 2. AIST, 3. GEOMAR

Keywords: West Eifel volcanic field, Mantle xenolith, Fluid inclusion, Microcrack, Hydraulic fracturing

Water contents and pressures of melts in unerupted felsic magma constrained by SEM-EDS analysis of homogenized melt inclusions in zircon

*Taichi Kawashima[1], Kazuya Shimooka[2], Toko Fukui[1], Satoshi Saito[1]

1. Ehime Univ., 2. Kwansei Gakuin Univ.

Granitic rocks (sensu lato) represent unerupted felsic magmas crystallized in the crust. In this study, we estimate water contents of melts and crystallization pressures of zircons in granitoid magma using melt inclusions in zircon, a ubiquitous accessory mineral in granitoids. Homogenization experiments of polymineralic inclusions hosted in zircon have been conducted for a granitoid sample from the Cretaceous Gamano granodiorite in Yashiro–jima Island, southwest Japan, using a piston-cylinder high-pressure–high-temperature apparatus. SEM-EDS analysis reveals that the homogenized melt inclusions have high water contents (6.4–11.3 wt%) and high SiO2 contents (76–78 wt% anhydrous basis) implying that they represent fractionated interstitial hydrous melts trapped in growing zircon crystals. A recently proposed machine learning-based melt–phase assemblage geobarometer yields pressures ranging from 563 to 266 MPa interpreted as crystallization pressures of the zircons. The results of this study suggest high water activity of the interstitial melts within the Gamano granodiorite magma at the time of zircon crystallization. The melt inclusions in zircons record a wide range of pressures, from intrusion of the magma into the deeper crustal levels (~563–500 MPa) to final solidification at shallower levels (~266 MPa).

Keywords: Unerupted felsic magma, Water contents, Crystallization pressures, Melt inclusion in zircon

Permeability and pore microstructures on the diktytaxitic texture of Ogurayama lava dome, Towada volcano

*Natsuko Sekiya[1], Michihiko Nakamura[2], Ryosuke Sakurai[3], Mayumi Mujin[2], Naoki Araya[2], Shingo Takeuchi[4], Yukiko Suwa[5]

1. Tohoku Univ. Sci., 2. Grad. Sch. of Sci., Tohoku Univ., 3. Univ. Tokyo, 4. CRIEPI, 5. CERES

Keywords: permeability, porosity, evaporation-condensation, degassing, Gas pycnometer

MD simulation of silicate melt and glass under tension deformation

*Ryota Mamizuka[1], Satoshi Okumura[1], Hiroshi Sakuma[2]

1. Tohoku Univ. Sci., 2. NIMS

Keywords: silicate melt, MD simulation, tensional deformation, ring structure

The magma plumbing system of Izu-Oshima Volcano: Constraints from the H_2O-saturated plagioclase liquidus

*Hidemi ISHIBASHI[1]

1. Shizuoka University

Keywords: Izu-Oshima volcano, Magma plumbing system, plagioclase, liquidus, pre-eruptive condition

Oral presentation | R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

Thu. Sep 12, 2024 10:00 AM - 12:00 PM JST | Thu. Sep 12, 2024 1:00 AM - 3:00 AM UTC | ES024 Higashiyama Campus

R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

Chairperson:Masanori Kurosawa, Hiroshi Kitawaki

10:00 AM - 10:20 AM JST | 1:00 AM - 1:20 AM UTC

[R1-01] Determination of analytical conditions in quantitative electron probe microanalysis of ultra-trace elements: probe current and sampling time

「招待講演」

*Takenori KATO[1] (1. ISEE, Nagoya University)

10:20 AM - 10:35 AM JST | 1:20 AM - 1:35 AM UTC

[R1-02] Mössbauer Spectra and Intensity Tensors of Quadrupole Doublets for Fe^{3+} and Fe^{2+} of Bridgmanite

*Keiji SHINODA[1], Yasuhiro Kobayashi[2], Takuo Okuchi[2] (1. Osaka Met. Univ. Sci, 2. KURNS)

10:35 AM - 10:50 AM JST | 1:35 AM - 1:50 AM UTC

[R1-03] Clay mineral characterization by Optical Photothermal Induced Resonance (O-PTIR)

「発表賞エントリー」

*Taro Kido[1], Yohey Suzuki[1] (1. The University of Tokyo)

10:50 AM - 11:05 AM JST | 1:50 AM - 2:05 AM UTC

[R1-04] Characterization and Identification of Synthetic Colored Diamonds for Jewelry Use

*Hiroshi KITAWAKI[1], Kentaro Emori[1], Mio Hisanaga[1], Masahiro Yamamoto[1] (1. Central Gem Laboratory)

11:05 AM - 11:15 AM JST | 2:05 AM - 2:15 AM UTC

[1Lecture-201-07-5add] 休憩

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

[R1-05] Blue Sapphire from Australia and its origin

*Kentaro Emori[1], Hiroshi Kitawaki[1] (1. Central Gem Laboratory)

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

[R1-06] Emerald origin characteristics and problems in origin determination

*Zhenghao Zhao[1], Hiroshi Kitawaki[1], Kentaro Emori[1] (1. Central Gem Laboratory)

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

[R1-07] Gem zircon and sapphire age dating and application of origin determination; A study from New England sapphire fields, New South Wales, Australia

*Ahmadjan ABDURIYIM[1] (1. Tokyo Gem Science LLC)

Determination of analytical conditions in quantitative electron probe microanalysis of ultra-trace elements: probe current and sampling time

*Takenori KATO[1]

1. ISEE, Nagoya University

Keywords: electron probe microanalysis (EPMA), trace elements, quantitative analysis, analytical conditions

Mössbauer Spectra and Intensity Tensors of Quadrupole Doublets for Fe^{3+} and Fe^{2+} of Bridgmanite

*Keiji SHINODA[1], Yasuhiro Kobayashi[2], Takuo Okuchi[2]

1. Osaka Met. Univ. Sci, 2. KURNS

Keywords: Bridgmanite, Mössbauer spectroscopy, Intensity tensor

Clay mineral characterization by Optical Photothermal Induced Resonance (O-PTIR)

*Taro Kido[1], Yohey Suzuki[1]

1. The University of Tokyo

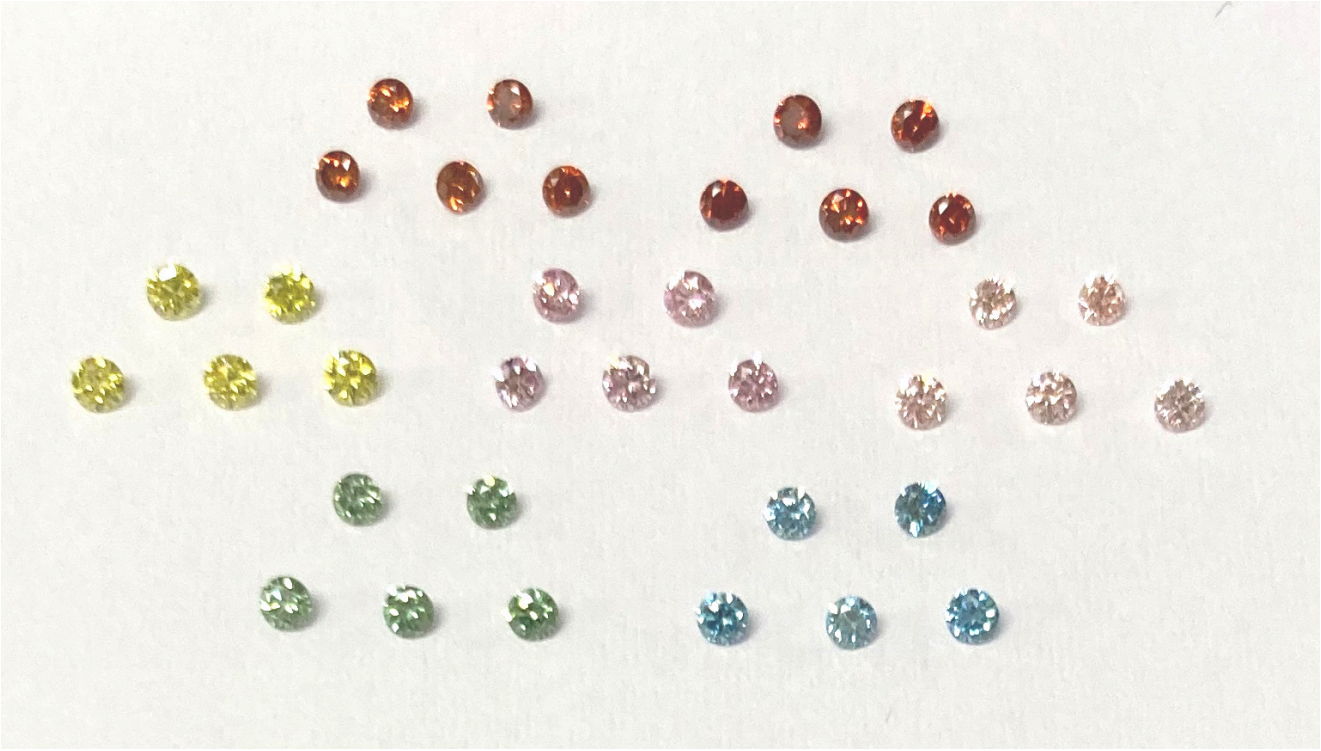
Keywords: smectite, IR spectroscopy, Raman spectroscopy, X-ray diffraction, SEM-EDS

Characterization and Identification of Synthetic Colored Diamonds for Jewelry Use

*Hiroshi KITAWAKI[1], Kentaro Emori[1], Mio Hisanaga[1], Masahiro Yamamoto[1]

1. Central Gem Laboratory

Keywords: melee size, synthetic diamond, fancy color diamond, CVD, HPHT



Oral presentation

R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

Chairperson:Masanori Kurosawa, Hiroshi Kitawaki

Thu. Sep 12, 2024 10:00 AM - 12:00 PM ES024 (Higashiyama Campus)

11:05 AM - 11:15 AM

[1Lecture-201-07-5add]休憩

Blue Sapphire from Australia and its origin

*Kentaro Emori[1], Hiroshi Kitawaki[1]

1. Central Gem Laboratory

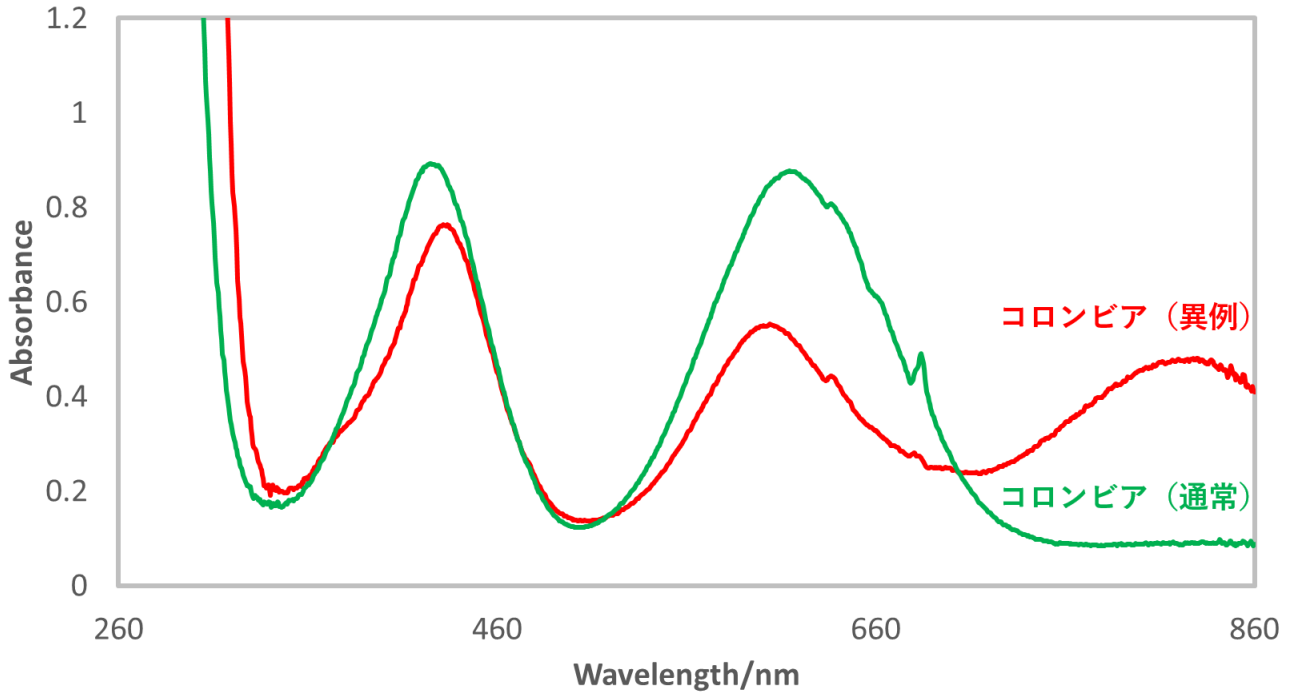
Keywords: LA-ICP-MS, corundum, origin determination, Australia

Emerald origin characteristics and problems in origin determination

*Zhenghao Zhao[1], Hiroshi Kitawaki[1], Kentaro Emori[1]

1. Central Gem Laboratory

Keywords: Emerald, Origin determination, FTIR Spectrum, UV-Vis-NIR Spectrum, LA-ICP-MS



Gem zircon and sapphire age dating and application of origin determination; A study from New England sapphire fields, New South Wales, Australia

*Ahmadjan ABDURIYIM[1]

1. Tokyo Gem Science LLC

Keywords: zircon, sapphire, U-Pb age dating, geographic origin, LA-ICP-MS

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

Thu. Sep 12, 2024 10:00 AM - 12:00 PM JST | Thu. Sep 12, 2024 1:00 AM - 3:00 AM UTC | ES025 Higashiyama Campus

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

Chairperson:Takeshi Sakai(Ehime University), Ryosuke Sinmyo(Meiji University), Takayuki Ishii(Okayama University), Takaaki Kawazoe(Hiroshima University)

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

[R3-01] Pressure-induced polyamorphic transition in $CaAl_2O_4$ glass revealed by elastic wave velocity and X-ray diffraction measurements and molecular dynamics simulations

「招待講演」

*Itaru Ohira[1], Yoshio Kono[2,3], Steeve Gréaux[3], James W E Drewitt[4], Sandro Jahn[5], Fumiya Noritake[6], Koji Ohara[7,8], Satoshi Hiroi[7,8], Nozomi M Kondo[9], Rostislav Hrubiak[10], Yuji Higo[8], Noriyoshi Tsujino[8], Sho Kakizawa[8], Kiyofumi Nitta[8], Oki Sekizawa[8] (1. Gakushuin Univ. Sci., 2. Kwansei Gakuin Univ. Sci., 3. Ehime Univ. GRC, 4. U. Bristol Phys., 5. U. Cologne IGM, 6. U. Yamanashi Interdisciplinary Research, 7. Shimane Univ. Materials for Energy, 8. JASRI, 9. Okayama Univ. IPM, 10. ANL HPCAT)

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

[R3-02] Structural analysis of CO_2-bearing sodium silicate melts using molecular dynamics simulations and synchrotron radiation X-ray diffraction experiments

「発表賞エントリー」

*Shino HAYAFUNE[1], Yohei Onodera[2], Shinji Kohara[2], Haruki Ichikawa[3], Tatsuya Sakamaki[1], Kenichi Funakoshi[4], Akio Suzuki[1] (1. Tohoku Univ. Graduate School of Science., 2. NIMS, 3. Tohoku Univ. School of Science., 4. CROSS)

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

[R3-03] Possible presence of poirierite, a high-pressure phase of $(Mg,Fe)_2SiO_4$, in the deep Earth's mantle

*Naotaka TOMIOKA[1], Takuo Okuchi[2], Narangoo Purevjav[3], Masaaki Miyahara[4] (1. KOCHI, JAMSTEC, 2. KRUNS, Kyoto Univ., 3. Seoul National Univ., 4. Earth Planet Sci., Hiroshima Univ.)

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

[R3-04] Temperature dependence of water content in wadsleyite and ringwoodite

*Toru INOUE[1,2], Yuji HAMADA[2], Hanae KAYA[2], Yusuke EGI[1], Daichi MAEDA[1], Kazutaka YAMAGUCHI[1], Konosuke YAMADA[1], Takaaki KAWAZOE[1,2] (1. Hiroshima Univ. Adv. Sci. Eng., 2. Hiroshima Univ. Sci.)

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

[R3-05] Temperature dependence of the $Fe^{3+}/\Sigma Fe$ ratio in wadsleyite by electron energy loss spectroscopy (EELS)

「発表賞エントリー」

*Kazutaka YAMAGUCHI[1], Takaaki Kawazoe[1], Toru Inoue[1], Naotaka Tomioka[2] (1. Hiroshima University, 2. JAMSTEC, Kochi institute)

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

[R3-06] Advantage on the analysis of cation site occupancies by neutron diffraction and some examples of application for high-pressure minerals

*Takuo OKUCHI[1] (1. Kyoto Univ.)

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

[R3-07] In situ lattice volume observation of davemaoite in the $CaSiO_3$-H_2O system up to uppermost lower mantle conditions

*Goru Takaichi[1], Takayuki Ishii[2], Yu Nishihara[1], Kyoko Matsukage[3], Yuji Higo[4], Noiyoshi Tsujino[4], Sho Kakizawa[4] (1. GRC, Ehime Univ., 2. IPM, Okayama Univ., 3. Teikyo University of Science, 4. JASRI)

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

[R3-08] Elasticity Measurements of Hydrous SiO_2 post-stishovite and its implication to the seismic anomalies in the lower mantle

「発表賞エントリー」

*Yuichiro MORI[1,2], Motohiko MURAKAMI[2], Takashi YOSHINO[3], Hiroyuki KAGI[1] (1. UTokyo. Sci., 2. ETHZ. D-ERDW., 3. Okayama Univ. IPM)

Pressure-induced polyamorphic transition in $CaAl_2O_4$ glass revealed by elastic wave velocity and X-ray diffraction measurements and molecular dynamics simulations

*Itaru Ohira[1], Yoshio Kono[2,3], Steeve Gréaux[3], James W E Drewitt[4], Sandro Jahn[5], Fumiya Noritake[6], Koji Ohara[7,8], Satoshi Hiroi[7,8], Nozomi M Kondo[9], Rostislav Hrubiak[10], Yuji Higo[8], Noriyoshi Tsujino[8], Sho Kakizawa[8], Kiyofumi Nitta[8], Oki Sekizawa[8]

1. Gakushuin Univ. Sci., 2. Kwansei Gakuin Univ. Sci., 3. Ehime Univ. GRC, 4. U. Bristol Phys., 5. U. Cologne IGM, 6. U. Yamanashi Interdisciplinary Research, 7. Shimane Univ. Materials for Energy, 8. JASRI, 9. Okayama Univ. IPM, 10. ANL HPCAT

In recent years, there has been increasing emphasis on the fabrication and characterization of non-conventional network glass formers such as $CaO–Al_2O_3$, $BaO–Al_2O_3$, and $BaO–TiO_2$ in material science [e.g., 1]. Although these systems are different from those of magmas traditionally studied in geoscience field, recent experiments have confirmed the formation of network-modifiers- and Al-rich partial melts at the conditions of the transition zone and the lower mantle [2,3]. Therefore, the high-pressure studies of non-conventional network glass formers, as well as typical network-forming oxide glasses such as SiO_2 glass, are also important in understanding the pressure-induced changes of structure and physical properties of the magmas in the deep earth.
In this study, we conducted elastic wave velocity and XRD measurements and molecular dynamics (MD) simulations on $CaAl_2O_4$ glass. Ultrasonic velocity measurements up to 24 GPa at BL04B1 at SPring-8 reveal abrupt and irreversible increases in the v_P and v_S at ~8–10 GPa. Total structure factor and pair distribution functions measured by synchrotron XRD at 16-BM-B at APS and BL37XU at SPring-8 show a rapid change in the intermediate range structure, which is likely attributed to a rearrangement of Ca ions over this narrow pressure condition. Structure models obtained from MD simulations reveal that this intermediate range structure is explained by a transition of Ca–O void radius distribution from a bimodal distribution with peaks at ~2.1 Åand ~2.4 Åto a single distribution centered at ~2.1 Å. The abrupt structural changes involving the rapid increase in elastic wave velocity in $CaAl_2O_4$ glass are markedly different to the continuous transformations reported in SiO_2 glass. The polyamorphic transition observed in this study may be one of the key mechanisms in the densification and the changes in seismic wave velocity of the magma just above the 410 km discontinuity.

References
[1] A. Masuno, J. Phys. Soc. Jpn. **91**, 091003 (2022).
[2] G. K. Pradhan *et al.*, Earth Planet. Sci. Lett., **431**, 247 (2015).
[3] A. Nakajima *et al.* Sci. Rep. **9**, 7420 (2019).

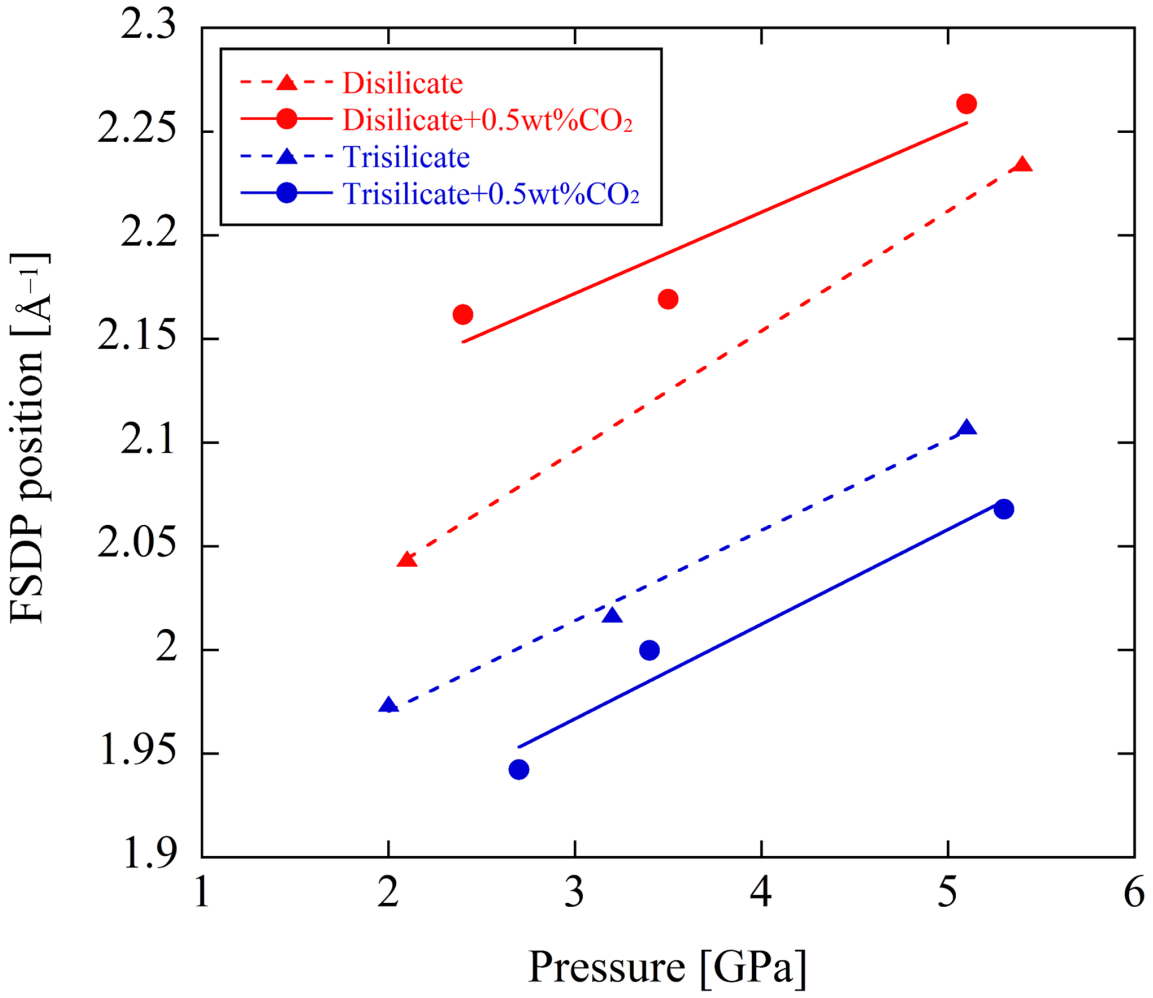
Keywords: oxide glass, polyamorphism, elastic wave velocity, synchrtron X-ray diffraction, molecular dynamics simulations

Structural analysis of CO_2-bearing sodium silicate melts using molecular dynamics simulations and synchrotron radiation X-ray diffraction experiments

*Shino HAYAFUNE[1], Yohei Onodera[2], Shinji Kohara[2], Haruki Ichikawa[3], Tatsuya Sakamaki[1], Kenichi Funakoshi[4], Akio Suzuki[1]

1. Tohoku Univ. Graduate School of Science., 2. NIMS, 3. Tohoku Univ. School of Science., 4. CROSS

Keywords: Sodium Silicate melt, Amorphous Structure Analysis, CO2



Possible presence of poirierite, a high-pressure phase of $(Mg,Fe)_2SiO_4$, in the deep Earth's mantle

*Naotaka TOMIOKA[1], Takuo Okuchi[2], Narangoo Purevjav[3], Masaaki Miyahara[4]

1. KOCHI, JAMSTEC, 2. KRUNS, Kyoto Univ., 3. Seoul National Univ., 4. Earth Planet Sci., Hiroshima Univ.

Keywords: olivine, poirierite, high-pressure phase transformation, transmission electron microscope

Temperature dependence of water content in wadsleyite and ringwoodite

*Toru INOUE[1,2], Yuji HAMADA[2], Hanae KAYA[2], Yusuke EGI[1], Daichi MAEDA[1], Kazutaka YAMAGUCHI[1], Konosuke YAMADA[1], Takaaki KAWAZOE[1,2]

1. Hiroshima Univ. Adv. Sci. Eng., 2. Hiroshima Univ. Sci.

Many researchers agree that the main constituent minerals of the mantle transition zone (MTZ: corresponding to 410-660 km depth) are wadsleyite (Wd) and ringwoodite (Rw), which are high-pressure polymorph of olivine. Although these phases are nominally anhydrous minerals (NAM), it has been shown that water can be present in the crystal structure at several wt% levels (e.g. Inoue et al., 1995; Kohlstedt et al., 1996) and that the MTZ can act as a water reservoir in the Earth interiors. In this context, Pearson et al. (2014) found ~1.4 wt% hydrous Rw in diamond inclusions, indicating that the MTZ is at least locally hydrous. Since the water content of minerals has a great influence on their physical properties, it is important to clarify the temperature dependence of water content in Wd and Rw in order to discuss the dynamics of the Earth's deep interior. Although previous studies have already shown the temperature dependence (Ohtani et al., 2001; Litasov and Ohtani, 2003), the results are inconsistent, and it is difficult to conclude that the temperature dependence has been clearly determined. Therefore, this experimental study was conducted to reexamine the temperature dependence of water content in Wd and Rw.

Keywords: wadsleyite, ringwoodite, maximum water solubility, mantle transition zone

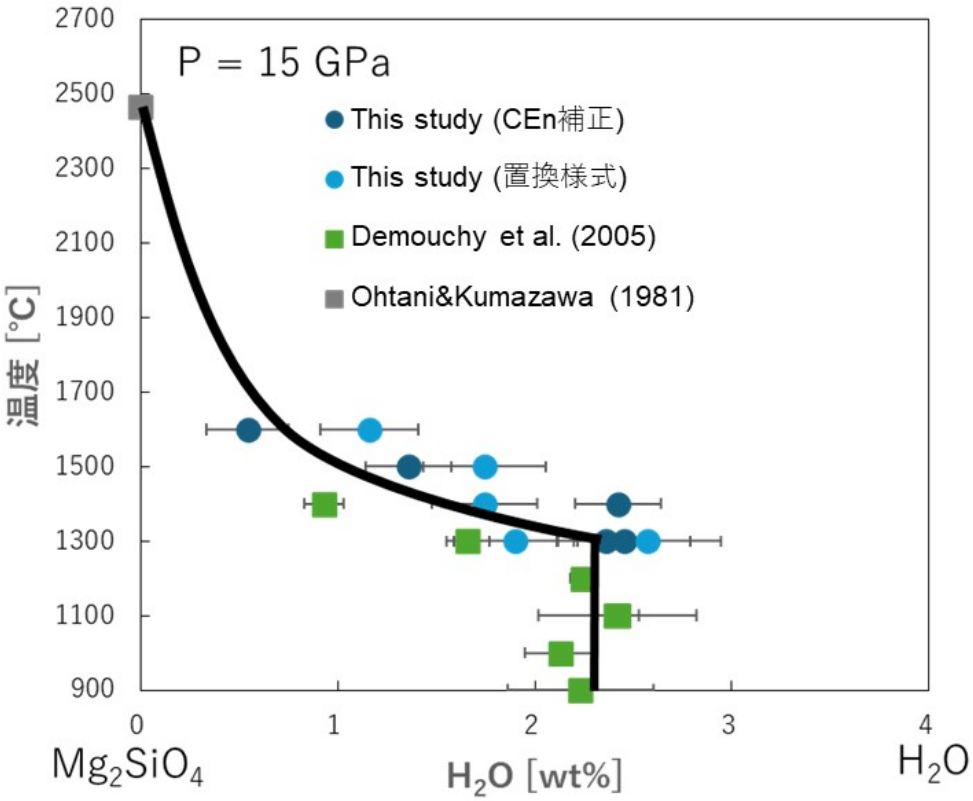


図1. Mg_2SiO_4 wadsleyite の最大含水量の温度依存性

Temperature dependence of the $Fe^{3+}/\Sigma Fe$ ratio in wadsleyite by electron energy loss spectroscopy (EELS)

*Kazutaka YAMAGUCHI[1], Takaaki Kawazoe[1], Toru Inoue[1], Naotaka Tomioka[2]

1. Hiroshima University, 2. JAMSTEC, Kochi institute

Keywords: Wadsleyite, Ferric iron, Oxygen fugacity, Electron energy loss spectroscopy

Advantage on the analysis of cation site occupancies by neutron diffraction and some examples of application for high-pressure minerals

*Takuo OKUCHI[1]

1. Kyoto Univ.

Keywords: Neutron diffracton

In situ lattice volume observation of davemaoite in the $CaSiO_3$-H_2O system up to uppermost lower mantle conditions

*Goru Takaichi[1], Takayuki Ishii[2], Yu Nishihara[1], Kyoko Matsukage[3], Yuji Higo[4], Noiyoshi Tsujino[4], Sho Kakizawa[4]

1. GRC, Ehime Univ., 2. IPM, Okayama Univ., 3. Teikyo University of Science, 4. JASRI

Keywords: Water transport, Nominally anhydrous minerals, Davemaoite, Mantle transition zone, Lower mantle

Elasticity Measurements of Hydrous SiO_2 post-stishovite and its implication to the seismic anomalies in the lower mantle

*Yuichiro MORI[1,2], Motohiko MURAKAMI[2], Takashi YOSHINO[3], Hiroyuki KAGI[1]

1. UTokyo. Sci., 2. ETHZ. D-ERDW., 3. Okayama Univ. IPM

Keywords: High-pressure experiments, Lower mantle, Water, Sound velocity measurements

Oral presentation | R7: Petrology, Mineralogy and Economic geology (Joint Session with Society of Resource Geology)

Thu. Sep 12, 2024 2:00 PM - 5:30 PM JST | Thu. Sep 12, 2024 5:00 AM - 8:30 AM UTC | ES Hall Higashiyama Campus

R7: Petrology, Mineralogy and Economic geology (Joint Session with Society of Resource Geology)

Chairperson:Norikatsu Akizawa(Atmosphere and Ocean Research Institute, University of Tokyo), Takuya Echigo(Akita University)

岩石学，鉱物学，鉱床学，地球化学などの分野をはじめとして，地球・惑星物質科学全般にわたる岩石及び鉱物に関する研究発表を広く募集する。地球構成物質についての多様な研究成果の発表の場となることを期待する。

2:00 PM - 2:25 PM JST | 5:00 AM - 5:25 AM UTC

[R7-01] The Frontier of Ilmenite Geochronology Using the Uranium-Lead Decay System

「招待講演」

*Kengo Ito[1], Sota Niki[2], Tsuyoshi Iizuka[3], Takafumi Hirata[1] (1. The Univ. of Tokyo. GcRC, 2. Nagoya Univ. ISEE, 3. The Univ. of Tokyo. Sci. EPS)

2:25 PM - 2:40 PM JST | 5:25 AM - 5:40 AM UTC

[R7-02] Distribution of rhenium in hydrothermal deposits in Japan, based on LA-ICP-MS analysis

「発表賞エントリー」

*Mitsuki Ogasawara[1], Junichiro Ohta[1,2], Kazutaka Yasukawa[1], Kentaro Nakamura[2,1], Yasuhiro Kato[1,2] (1. Univ. Tokyo. Eng, 2. CIT. ORCeNG)

2:40 PM - 2:55 PM JST | 5:40 AM - 5:55 AM UTC

[R7-03] Occurrences of the PGE bearing (Fe,Ni,Co)AsS solid solution in the Bushveld Complex, South Africa

「発表賞エントリー」

*Sakuya Kubota[1], Takuya Echigo[1], Yasushi Watanabe[1] (1. Akita Univ. Irs.)

2:55 PM - 3:10 PM JST | 5:55 AM - 6:10 AM UTC

[R7-04] Shiranuiite and placer deposit of platinum group minerals, Haraigawa, Misato machi, Kumamoto Prefecture, Japan

*Daisuke HAMANE[1], Takahiro Tanaka, Tadashi Shinmachi (1. The University of Tokyo)

3:10 PM - 3:25 PM JST | 6:10 AM - 6:25 AM UTC

[R7-05] Geochmical and Sr-Nd isotopic characteristics of the Aitutaki peridotite xenoliths from the Cook islands

*Masako YOSHIKAWA[1], Norikatsu Akizawa[2] (1. Hiroshima Univ., 2. Tokyo Univ. AORI)

3:25 PM - 3:40 PM JST | 6:25 AM - 6:40 AM UTC

[R7-06] Hydration of the mantle and magma genesis in the Izu–Bonin-Mariana fore-arc

*Rion Yamaoka[1], Norikatsu Akizawa[1], Yuji Ichiyama[2], ToTomoaki Morishita[3], Akihiro Tamura[3], Hiroyuki Yamashita[4], Yumiko Harigane[5], Yasuhiko Ohara[6,7,8] (1. University of Tokyo, 2. Chiba Univ., 3. Kanazawa Univ., 4. Kanagawa Prefectural Museum of Natural History, 5. AIST, 6. Japan Coast Guard,Hydrographic and Oceanographic Department, 7. JAMSTEC, 8. Nagoya Univ.)

3:40 PM - 3:50 PM JST | 6:40 AM - 6:50 AM UTC

[1Lecture-108-19-7add] 休憩

3:50 PM - 4:15 PM JST | 6:50 AM - 7:15 AM UTC

[R7-07] Fault-rock mineralogy and weakening mechanisms at deep- to shallow-crustal depths of Main Himalayan Thrust, NW India

「招待講演」

*Dyuti Prakash SARKAR[1], Takehiro Hirose[1], Jun-ichi Ando[2], Kaushik Das[2], Gautam Ghosh[3] (1. Japan Agency for Marine-Earth Science and Technology (JAMSTEC), 2. Hiroshima University, 3. Presidency University)

4:15 PM - 4:30 PM JST | 7:15 AM - 7:30 AM UTC

[R7-08] On the Relationship between Phosphorus Concentration and Microstructure in Goethite in Australian Iron Ore

*Takashi MIKOUCHI[1], Reiko Murao[2], Toru Takayama[2] (1. Univ. Museum, Univ. of Tokyo, 2. Nippon Steel)

4:30 PM - 4:45 PM JST | 7:30 AM - 7:45 AM UTC

[R7-09] Mineral zoning and formation temperatures around the Myokenzan lithium pegmatites

「発表賞エントリー」

*Takumi Ishizaki[1], Takuya Echigo[1], Yasushi Watanabe[1] (1. Akita Univ.)

4:45 PM - 5:00 PM JST | 7:45 AM - 8:00 AM UTC

[R7-10] Copper as a Coloring Factor of Pale Blue Sepiolite in amygdales in Higashimatsuura basalt from Kabeshima, Saga Prefecture, SW Japan

「発表賞エントリー」

*Satsuki KIO[1], Terumi Ezima[2], Yoshiaki Kon[3], Hikari Minamisawa[4], Masaomi Horita[4] (1. Shinshu Univ. Sci., 2. Shinshu Univ. Sci. , 3. GSJ, AIST, 4. Shinshu Univ. Eng.)

5:00 PM - 5:15 PM JST | 8:00 AM - 8:15 AM UTC

[R7-11] Quantification of Mineral Modal and Zoning Ratios by Powder X-ray Diffraction: Advancing Towards Big Data Era

「発表賞エントリー」

*Satoshi MATSUNO[1], Shuhou Maitani[2], Kenta Yoshida[3], Nobuo Hirano[1], Ryosuke Sinmyo[2], Keiichi Osaka[4], Shin-ichi Yamasaki[1], Masaoki Uno[1], Atsushi Okamoto[1] (1. Tohoku University, 2. Meiji University, 3. JAMSTEC, 4. Japan Synchrotron Radiation Research Institute)

5:15 PM - 5:30 PM JST | 8:15 AM - 8:30 AM UTC

[R7-12] Searching for Dark Matter Using Geological Samples: Techniques and Preliminary Results

*Natsue ABE[1,2], Shigenobu Hirose[1], Qing CHANG[1], Takeshi Hanyu[1], Noriko Hasebe[2], Yasushi Hoshino[3], Takashi Kamiyama[4], Yoji Kawamura[1], Kohta Murase[5], Tatsuhiro Naka[6], Kenji Oguni[1], Katsuhiko Suzuki[1], Seiko Yamazaki[7] (1. JAMSTEC, 2. Kanazawa University, 3. Kanagawa University, 4. Hokkaido University, 5. Penn State University, 6. Toho University, 7. AIST)

The Frontier of Ilmenite Geochronology Using the Uranium-Lead Decay System

*Kengo Ito[1], Sota Niki[2], Tsuyoshi Iizuka[3], Takafumi Hirata[1]

1. The Univ. of Tokyo. GcRC, 2. Nagoya Univ. ISEE, 3. The Univ. of Tokyo. Sci. EPS

Keywords: Ilmenite, Geochronology, U-Pb dating, LA-ICP-MS

Distribution of rhenium in hydrothermal deposits in Japan, based on LA-ICP-MS analysis

*Mitsuki Ogasawara[1], Junichiro Ohta[1,2], Kazutaka Yasukawa[1], Kentaro Nakamura[2,1], Yasuhiro Kato[1,2]

1. Univ. Tokyo. Eng, 2. CIT. ORCeNG

Keywords: Hydrothermal deposit, LA-ICP-MS, Re mapping, Re-Os radiometric dating

Occurrences of the PGE bearing (Fe,Ni,Co)AsS solid solution in the Bushveld Complex, South Africa

*Sakuya Kubota[1], Takuya Echigo[1], Yasushi Watanabe[1]

1. Akita Univ. Irs.

Keywords: PGE mineralization, Bushveld Complex, Assimilation

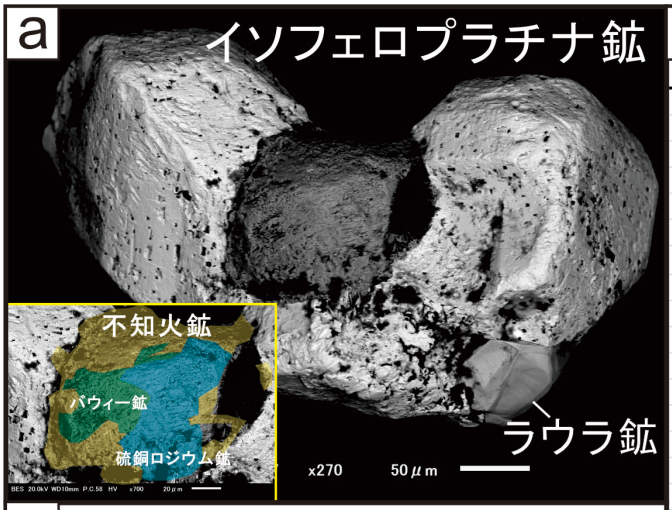
Shiranuiite and placer deposit of platinum group minerals, Haraigawa, Misato machi, Kumamoto Prefecture, Japan

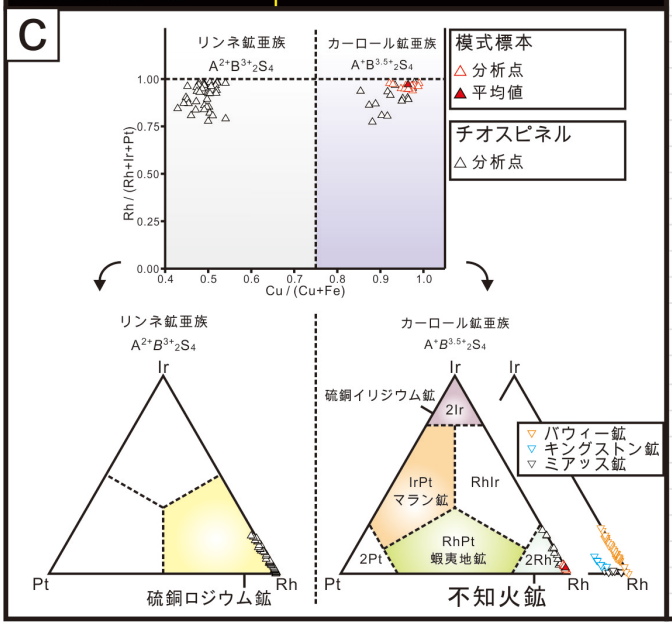
*Daisuke HAMANE[1], Takahiro Tanaka, Tadashi Shinmachi

1. The University of Tokyo

We have discovered a placer deposit of platinum-group minerals (PGM) in the clinopyroxene mass, Haraigawa, Misato machi, Kumamoto Prefecture. Two new minerals, minakawaite and michitoshiite-(Cu), were discovered in this deposit, and an unknown mineral of the thiospinel group was also found. It is named shiranuiite and was approved as a new mineral (IMA2023-072a). Most placer grains are isoferroplatinum: Pt_3Fe, and some grains have been altered at the outer edge (several to several hundred μm) to tulameenite: Pt_2CuFe or tetraferroplatinum: PtFe, showing the influence of post-magmatic alteration. Bowieite: Rh_2S_3, the second most abundant inclusions, rarely appear on the surface of grains, while it is altered to often cuprorhodsite: $(Cu^{+}_{0.5}Fe^{3+}_{0.5})Rh^{3+}_{2}S_4$ and rarely shiranuiite: $Cu^{+}(Rh^{3+}Rh^{4+})S_4$. The empirical formula of shiranuiite is $(Cu^{+}_{0.95}Fe^{3+}_{0.04}Ni_{0.01})(Rh^{3+}_{1.19}Rh^{4+}_{0.77}Ir^{4+}_{0.06})S_{3.99}$, and the unit cell parameter is a = 9.757 Å on Fd-3m space group.

Keywords: Platinum-group minerals (PGM), Placer PGM, Shiranuiite





b

No.	鉱物名	理想化学式	産状
1	Andrieslombaardite	RhSbS	コブ
2	Bowieite	Rh_2S_3	包有物（多）、コブ（稀）
3	Braggite	$PdPt_3S_4$	粒子の外縁
4	Chengdeite	Ir_3Fe	自然イリジウムの外縁
5	Cherepanovite	RhAs	コブ
6	Cooperite	PtS	粒子の外縁
7	Cuprorhodsite	$(Cu^{+}_{0.5}Fe^{3+}_{0.5})Rh^{3+}_{2}S_4$	コブ
8	Erlichmanite	OsS_2	包有物、コブ
9	Ferrotorryweiserite	$Rh_5Fe_{10}S_{16}$	コブ
10	Genkinite	Pt_4Sb_3	包有物
11	Geversite	$PtSb_2$	包有物
12	Hexaferrium	(Fe,Os,Ru,Ir)	包有物
13	Hollingworthite	RhAsS	外縁の包有物
14	Irarsite	IrAsS	外縁の包有物
15	Iridium	Ir	自然オスミウム粒子に付属
16	Isoferroplatinum	Pt_3Fe	粒子
17	Keithconnite	$Pd_{20}Te_7$	包有物
18	Kingstonite	Rh_3S_4	包有物
19	Kuvaevite	$Ir_5Ni_{10}S_{16}$	包有物
20	Laurite	RuS_2	包有物、コブ
21	Miassite	$Rh_{17}S_{15}$	包有物
22	Michitoshiite-(Cu)	$Rh(Cu_{1-x}Ge_x)$ $0<x\leq0.5$	コブの外縁
23	Minakawaite	RhSb	コブの外縁
24	Moncheite	$Pt(Te,Bi)_2$	包有物
25	Naldrettite	Pd_2Sb	包有物
26	Osmium	Os	包有物（多）、粒子（稀）
27	Palladinite	PdO	包有物
28	Platinum	Pt	粒子の外縁
29	Rustenburgite	Pt_3Sn	コブ
30	Shiranuiite	$Cu^{+}(Rh^{3+}Rh^{4+})S_4$	コブ
31	Sperrylite	$PtAs_2$	粒子の外縁
32	Stibiopalladinite	Pd_5Sb_2	包有物
33	Tamuraite	$Ir_5Fe_{10}S_{16}$	コブ
34	Telluropalladinite	Pd_9Te_4	包有物
35	Tetraferroplatinum	PtFe	粒子の外縁
36	Tolovkite	IrSbS	外縁の包有物
37	Tomamaeite	Cu_3Pt	外縁の包有物
38	Torryweiserite	$Rh_5Ni_{10}S_{16}$	包有物
39	Tulameenite	Pt_2CuFe	粒子の外縁

図1. 砂白金粒子の表面に露出したバウィー鉱と不知火鉱（硫銅ロジウム鉱）の分布（a）、産出鉱物の一覧（b）、不知火鉱（硫銅ロジウム鉱）とRh-S鉱物（バウィー鉱、キングストン鉱、ミアス鉱）の組成分布（c）。

Geochmical and Sr-Nd isotopic characteristics of the Aitutaki peridotite xenoliths from the Cook islands

*Masako YOSHIKAWA[1], Norikatsu Akizawa[2]

1. Hiroshima Univ., 2. Tokyo Univ. AORI

Keywords: Aitutaki island, mantle peridotite xenolith, Sr-Nd isotopic ratios

Hydration of the mantle and magma genesis in the Izu–Bonin-Mariana fore-arc

*Rion Yamaoka[1], Norikatsu Akizawa[1], Yuji Ichiyama[2], ToTomoaki Morishita[3], Akihiro Tamura[3], Hiroyuki Yamashita[4], Yumiko Harigane[5], Yasuhiko Ohara[6,7,8]

1. University of Tokyo, 2. Chiba Univ., 3. Kanazawa Univ., 4. Kanagawa Prefectural Museum of Natural History, 5. AIST, 6. Japan Coast Guard,Hydrographic and Oceanographic Department, 7. JAMSTEC, 8. Nagoya Univ.

Keywords: Subduction zone, Hydration, Fore-arc magma genesis, Peridotite, Amphibole

Oral presentation

R7: Petrology, Mineralogy and Economic geology (Joint Session with Society of Resource Geology)

Chairperson:Norikatsu Akizawa(Atmosphere and Ocean Research Institute, University of Tokyo), Takuya Echigo(Akita University)

Thu. Sep 12, 2024 2:00 PM - 5:30 PM ES Hall (Higashiyama Campus)

岩石学，鉱物学，鉱床学，地球化学などの分野をはじめとして，地球・惑星物質科学全般にわたる岩石及び鉱物に関する研究発表を広く募集する。地球構成物質についての多様な研究成果の発表の場となることを期待する。

3:40 PM - 3:50 PM

[1Lecture-108-19-7add]休憩

Fault-rock mineralogy and weakening mechanisms at deep- to shallow-crustal depths of Main Himalayan Thrust, NW India

*Dyuti Prakash SARKAR[1], Takehiro Hirose[1], Jun-ichi Ando[2], Kaushik Das[2], Gautam Ghosh[3]

1. Japan Agency for Marine-Earth Science and Technology (JAMSTEC), 2. Hiroshima University, 3. Presidency University

Fault rock mineralogy and deformation microstructures of crustal-scale faults provide insights into the stress accommodation mechanisms in terms of fault weakening and possibilities of earthquake nucleation. The Main Himalayan Thrust is considered to be the crustal-scale collisional boundary along which the Indian plate subducts beneath the Asian plate. The near-surface exposure of the present active boundary of the subduction is considered the Main Frontal Thrust, while the Main Central Thrust at the northernmost boundary represents the older post-collisional paleo-thrust boundaries between Indian and Asian plates. Here we present a comparative study of our findings on the fault rocks from the Nahan Thrust and North Almora Thrust belonging to the Main Frontal Thrust and the Main Central Thrust respectively. The deformation zone from North Almora Thrust represents the deep crustal part of the Main Himalayan Thrust exhibiting granite mylonite-ultramylonite zone. Quartz microstructures indicate deformation temperatures of 450–550 ℃ with evidence of grain-size sensitive creep as the dominant weakening mechanism. Additionally, two-feldspar thermometry has been used to estimate temperatures from sheared myrmekitic feldspar in the mylonites and ultramylonites. Crystallographic preferred orientations of quartz and mica indicate a shift in partitioning of strain from quartz to mica with an increase in mica content. In comparison, the fault zone from the Nahan Thrust shows the dominance of brittle deformation structures consisting of highly brecciated sandstone and a wide gouge zone. Microstructures of the gouge zone indicate distributed deformation and progressive stress localization leading to fracture development, cataclasis, and frictional sliding. Especially the ultra-fine bands of the principle slip zone exhibit a possible fingerprint of frictional heating during the seismic slips. The frictional properties of the fault rocks estimated from the rotary-shear velocity step experiments also indicate a velocity weakening to strengthening behavior based on phyllosilicate content. Our results on fault rocks from deep- to shallow-crustal depth indicate that phyllosilicate content play a pivotal role in frictional behavior and weakening mechanisms along the subduction boundary.

Keywords: Main Himalayan Thrust, Main Central Thrust, Main Frontal Thrust, rock friction, phyllosilicates

On the Relationship between Phosphorus Concentration and Microstructure in Goethite in Australian Iron Ore

*Takashi MIKOUCHI[1], Reiko Murao[2], Toru Takayama[2]

1. Univ. Museum, Univ. of Tokyo, 2. Nippon Steel

Keywords: Iron Ore, Goethite, Phosphorous, Microstructure

Mineral zoning and formation temperatures around the Myokenzan lithium pegmatites

*Takumi Ishizaki[1], Takuya Echigo[1], Yasushi Watanabe[1]

1. Akita Univ.

Keywords: Pegmatite, Crystallization fractionation, Garnet-biotite geothermometer, Mineral zoning

Copper as a Coloring Factor of Pale Blue Sepiolite in amygdales in Higashimatsuura basalt from Kabeshima, Saga Prefecture, SW Japan

*Satsuki KIO[1], Terumi Ezima[2], Yoshiaki Kon[3], Hikari Minamisawa[4], Masaomi Horita[4]

1. Shinshu Univ. Sci., 2. Shinshu Univ. Sci. , 3. GSJ, AIST, 4. Shinshu Univ. Eng.

Keywords: Kabeshima Island, sepiolite, copper, Higashimatsuura Basalt

Quantification of Mineral Modal and Zoning Ratios by Powder X-ray Diffraction: Advancing Towards Big Data Era

*Satoshi MATSUNO[1], Shuhou Maitani[2], Kenta Yoshida[3], Nobuo Hirano[1], Ryosuke Sinmyo[2], Keiichi Osaka[4], Shin-ichi Yamasaki[1], Masaoki Uno[1], Atsushi Okamoto[1]

1. Tohoku University, 2. Meiji University, 3. JAMSTEC, 4. Japan Synchrotron Radiation Research Institute

Keywords: Powder X-ray Diffraction, Rietveld Refinement, Mineral Modal, Mineral Zoning, Quantification

Searching for Dark Matter Using Geological Samples: Techniques and Preliminary Results

*Natsue ABE[1,2], Shigenobu Hirose[1], Qing CHANG[1], Takeshi Hanyu[1], Noriko Hasebe[2], Yasushi Hoshino[3], Takashi Kamiyama[4], Yoji Kawamura[1], Kohta Murase[5], Tatsuhiro Naka[6], Kenji Oguni[1], Katsuhiko Suzuki[1], Seiko Yamazaki[7]

1. JAMSTEC, 2. Kanazawa University, 3. Kanagawa University, 4. Hokkaido University, 5. Penn State University, 6. Toho University, 7. AIST

The traces of cosmic rays from inside and outside the Earth recorded in geological samples can be effectively used for geological and astrophysical research. For instance, studies using Antarctic ice cores have estimated the number and age of supernova explosions and observed geoneutrinos from Earth's interior. Research utilizing seabed samples to measure cosmic ray intensity is also expected to provide insights into various events over long geological periods. Only about 5% of the matter in the universe can be directly observed, including such cosmic rays. In contrast, approximately 70% is dark energy, and the remaining 25% or more is dark matter. To search for such unknown matter or energy, large detectors using xenon are typically employed for dark matter detection. However, their scalability could be improved, making it challenging to improve detection limits. Considering this situation, we are exploring methods other than large detectors. For example, natural minerals like mica have been around for geological time scales, providing plenty of exposure even in small samples. These minerals can retain nuclear recoil tracks—evidence of dark matter interactions—for periods longer than the Earth's age. When etched, these tracks appear as observable pits. In 1995, Snowden-Ifft and colleagues studied natural Muscovite that was 500 million years old and covered an area of just 0.08 square millimeters. We propose using natural minerals (such as olivine and mica) that have long formation periods and are collected from deep within the ocean floor or continents with minimal surrounding radioactive substances. We are developing the necessary observational techniques to identify traces of dark matter as "Paleo-detectors" in these samples. Although there is still a long way to go before making an actual observation, this presentation will share our current efforts and discuss more efficient observation methods.

Keywords: Paleo-detectors, Dark Matter, Geoneutrino, Cosmic rays

Oral presentation | R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

Thu. Sep 12, 2024 2:00 PM - 3:15 PM JST | Thu. Sep 12, 2024 5:00 AM - 6:15 AM UTC | ES024 Higashiyama Campus

R1: Characterization and description of minerals (Joint Session with The Gemmological Society of Japan)

Chairperson:Koichi Momma, Yohei Shirose

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

[R1-08] Ultra nano inclusion in blue sapphire from Diego, Madagascar

*Akira MIYAKE[1], Seika Oto[1], Yohei Igami[1], Kentaro Emori[2] (1. Kyoto University, 2. CGL)

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

[R1-09] Reexamination of the symmetry of itoigawaite

*Chigako KIYOHARA, Yohei Igami[1], Akira Miyake[1], Norimasa Shimobayashi[1] (1. Kyoto Univ. Sci.)

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

[R1-10] Zeolite and altered boninite from Miyanohama, Ogasawara, Japan

*Yuki INOUE[1], Mana Yasui[2], Jun-ichiro Ishibashi[3], Hagiya Hiroshi[4], Kazuhiko Shimada[1], Athushi Yamazaki[2] (1. Kyushu Univ. Sci., 2. Waseda Univ. , 3. Kobe Univ., 4. Tokyo City Univ.)

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

[R1-11] Willemseite from the Hamayokawa mine, Nagano Prefecture, Japan

*Satoshi Matsubara[1], Koichi Momma[1], Norio Yanagisawa[2], Yoko Kusaba[1], Akiko Tokumoto[1], Ritsuro Miyawaki[1] (1. National Museum of Nature and Science, 2. Geological Survey of Japan, AIST)

3:00 PM - 3:15 PM JST | 6:00 AM - 6:15 AM UTC

[R1-12] On the Fe^{2+}-analogue of zemannite from Kawazu mine, Shizuoka Prefecture, Japan

*Koichi MOMMA[1], Owen Missen[2], Stuart Mills[3], Ritsuro Miyawaki[1], Satoshi Matsubara[1], Eiji Ohtani[4], Seiji Kamada[5], Shin Ozawa[4] (1. National Museum of Nature and Science, 2. University of Tasmania, 3. The Arkenstone, 4. Tohoku Univ., 5. AD Science Inc.)

Ultra nano inclusion in blue sapphire from Diego, Madagascar

*Akira MIYAKE[1], Seika Oto[1], Yohei Igami[1], Kentaro Emori[2]

1. Kyoto University, 2. CGL

Ultra-nano inclusions in Be-containing natural blue sapphires (corundum) from Diego, Madagascar were observed and analysed by transmission electron microscope (TEM) and 3D atomprobe (3DAP). TEM results show that ultra-nano inclusion has 10 nm length and 2 nm width, and the nano-inclusion is identified by Wolframite structure (P2/c). 3DAP results show the inclusion consists of Ti, Nb, Ta, Fe, Sn.

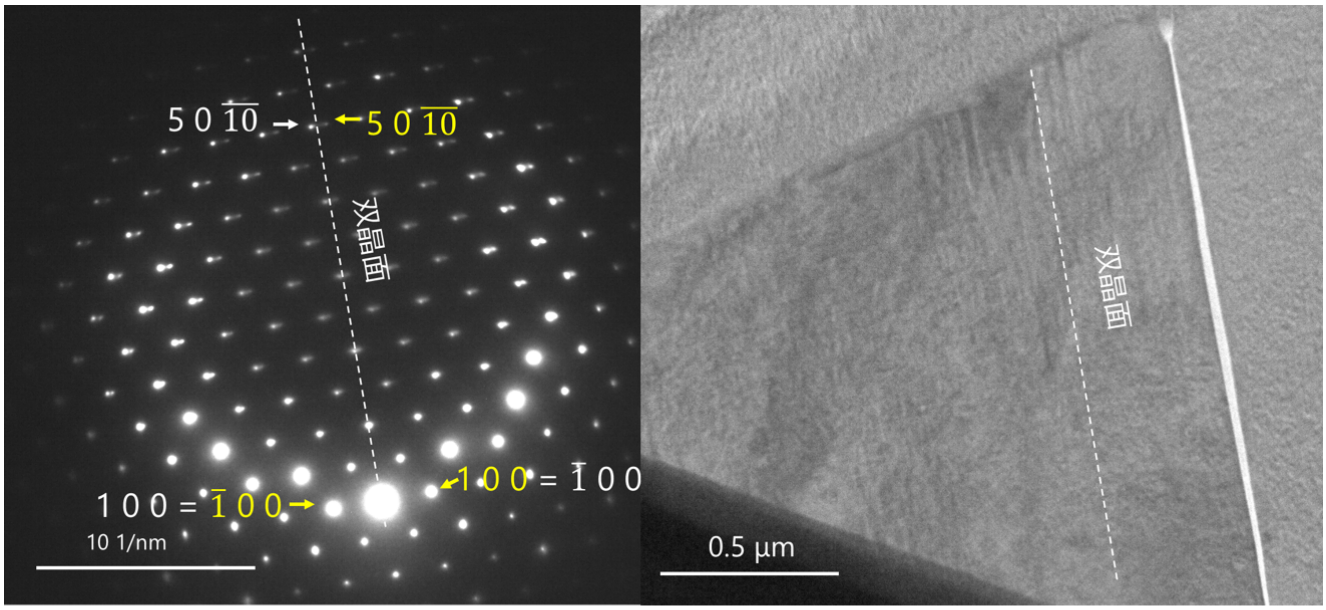
Keywords: Ultra-nano inclusion, corundum)

Reexamination of the symmetry of itoigawaite

*Chigako KIYOHARA, Yohei Igami[1], Akira Miyake[1], Norimasa Shimobayashi[1]

1. Kyoto Univ. Sci.

Keywords: Itoigawaite, symmetry



図：糸魚川石中の細かい筋状組織のTEM明視野像とその部分から得られた電子回折図形。
端の方のスポットは2つに分裂しており、そのため結晶格子の軸角が 90° からわずかにずれていると考えられる。

Zeolite and altered boninite from Miyanohama, Ogasawara, Japan

*Yuki INOUE[1], Mana Yasui[2], Jun-ichiro Ishibashi[3], Hagiya Hiroshi[4], Kazuhiko Shimada[1], Athushi Yamazaki[2]

1. Kyushu Univ. Sci., 2. Waseda Univ. , 3. Kobe Univ., 4. Tokyo City Univ.

Keywords: zeolite, Boninite, phillipsite

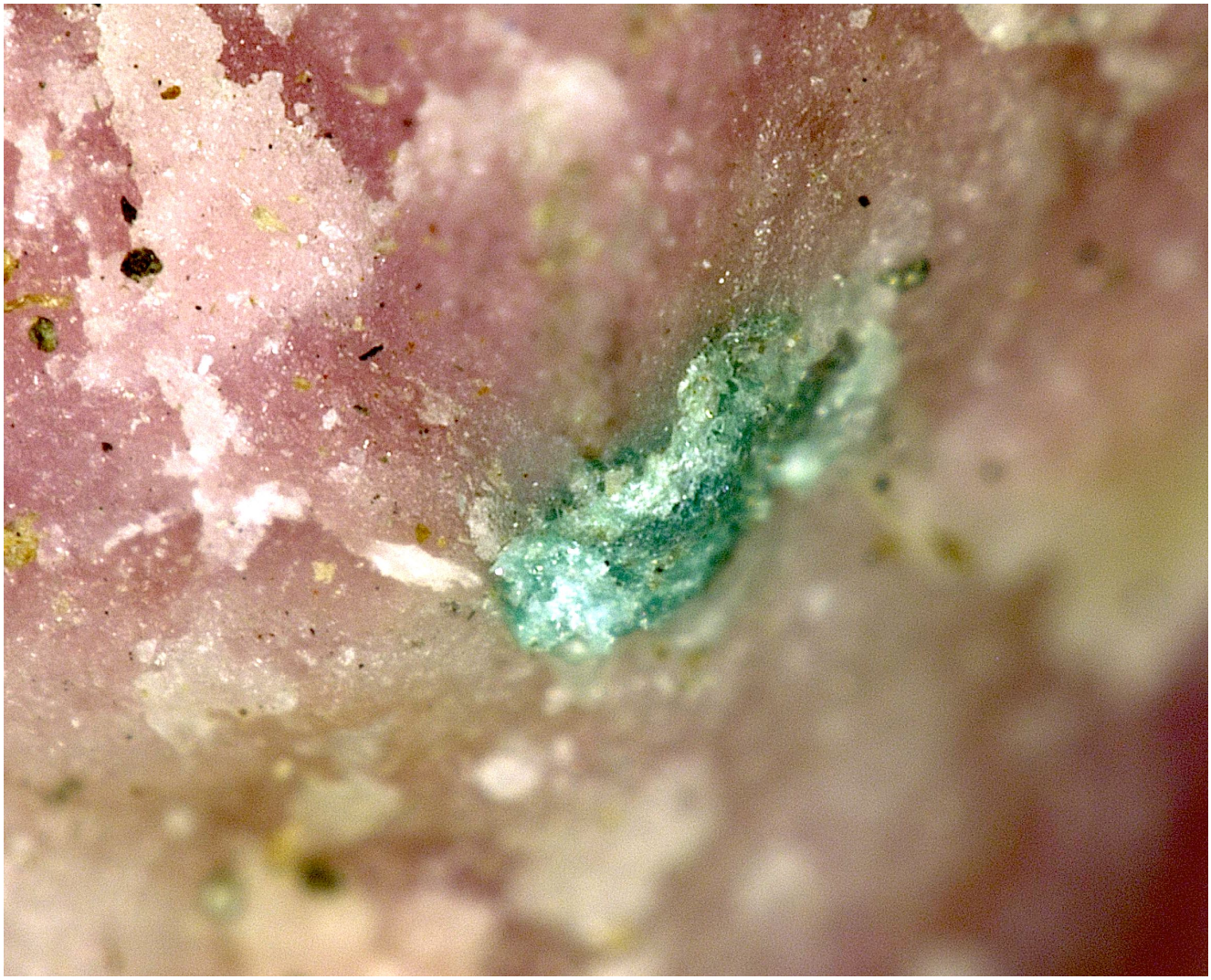
Willemseite from the Hamayokawa mine, Nagano Prefecture, Japan

*Satoshi Matsubara[1], Koichi Momma[1], Norio Yanagisawa[2], Yoko Kusaba[1], Akiko Tokumoto[1], Ritsuro Miyawaki[1]

1. National Museum of Nature and Science, 2. Geological Survey of Japan, AIST

Rare mineral, suzukiite, was reported from the metamorphosed manganese ore deposit of the Hamayokawa mine (Hirowatari & Yoshie, 1978). Althogh some specimens from the Hamayokokawa mine, Nagano Prefecture, Japan donated by amature mineralogists in the National Museum of Nature and Science and the Geological Survey of Japan are registered as suzukiite, but recent our analyses reveal they are not suzukiite but willemseite [$(Ni_3Si_4O_{10}(OH)_2$] which is first found in Japan.

Keywords: suzukiite, willemseite, Hamayokokawa mine



On the Fe^{2+}-analogue of zemannite from Kawazu mine, Shizuoka Prefecture, Japan

*Koichi MOMMA[1], Owen Missen[2], Stuart Mills[3], Ritsuro Miyawaki[1], Satoshi Matsubara[1], Eiji Ohtani[4], Seiji Kamada[5], Shin Ozawa[4]

1. National Museum of Nature and Science, 2. University of Tasmania, 3. The Arkenstone, 4. Tohoku Univ., 5. AD Science Inc.

The Kawazu Mine in Shimoda City, Shizuoka Prefecture, has been known as type locality of two new minerals, kawazulite (Bi_2Te_2Se) and kinichilite. In the original description of kinichilite, its chemical composition was reported as $(Fe^{2+}_{1.13}Mg_{0.47}Zn_{0.43}Mn^{2+}_{0.17})_{\Sigma 2.20}(Te_{2.97}Se_{0.03})_{\Sigma 3.00}O_{9.00}(H_{1.38}Na_{0.22})_{\Sigma 1.60}$ ・$3.2H_2O$, and as Fe analogue of zemannite at that time. Later, however, crystal chemical study of zemannite revealed that its ideal formula is $Mg_{0.5}[ZnFe^{3+}(TeO_3)_3]$・$4.5H_2O$, *i.e.*, iron is not 2+ but 3+ and both Zn^{2+} and Fe^{3+} are essential. If the originally reported chemical composition of kinichilite is recalculated based on this find, it remains in the compositional range of zemannite. However, R. Miletich (1995), in his study of zemannite group minerals, also examined the "kinichilite" from the Kawazu mine and found that manganese was predominant as a divalent ion in most of the analyzed point. He considered it as kinichilite and redefined its ideal formula as $Mg_{0.5}[MnFe^{3+}(TeO_3)_3]$・$4.5H_2O$. Here, we report Fe analogue of zemannite, in which divalent iron exceeds zinc, manganese and other divalent ions. One of the collections of the National Museum of Nature and Science (NSM-M41022) was used in this study. Chemical analysis was performed using a scanning electron microscope (JEOL JSM-6610) equipped with an energy dispersive X-ray spectroscopic detector (EDS). Water content was estimated by the difference from 100% of the EDS analysis. Single crystal X-ray diffraction (SXRD) experiments were performed using a Rigaku Synergy Custom equipped with a rotating anode and a multilayer X-ray focusing mirror (VariMax).

The empirical formula obtained from the average of four analytical points is $Mg_{0.40}(Fe^{2+}_{0.54}Zn_{0.33}Cu_{0.18}Mn_{0.05})_{\Sigma 1.10}Fe^{3+}_{1.00}(Te_{2.92}P_{0.06}O_9)$ ・$4.12H_2O$. The SXRD experiment gave the space group $P6_3$ (or $P6_3/m$) with lattice parameters a = 9.37765(11), c = 7.58379(9), V = 577.570(15). The refinement converged with reliability index $R1$ = 1.56% and it was confirmed to be isostructural with zemannite. Distribution of the channel cations and bond lengths of the framework M sites indicate symmetry lowering from $P6_3/m$ to $P6_3$.

Keywords: zemannite, kinichilite, Kawazu mine

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

Thu. Sep 12, 2024 2:00 PM - 3:15 PM JST | Thu. Sep 12, 2024 5:00 AM - 6:15 AM UTC | ES025 Higashiyama Campus

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

Chairperson:Takeshi Sakai(Ehime University), Ryosuke Sinmyo(Meiji University), Takayuki Ishii(Okayama University), Takaaki Kawazoe(Hiroshima University)

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

[R3-09] Electrical conductivity of the lower mantle materials under high pressure with implication for valence and spin states of iron

「招待講演」

*Izumi MASHINO[1] (1. Okayama Univ.)

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

[R3-10] GHz-DAC ultrasonics to measure elastic anomaly with the spin transition of ferrous ion in ferropericlase

*Akira Yoneda[1], Izumi Mashino[2], Ryosuke Matsui[1], Ryoma Ishida[1], Tadashi Kondo[1] (1. Osaka Univ. Sci, 2. Okayama Univ. IPM)

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

[R3-11] Reaction between water and iron in the early magma ocean and the present core-mantle boundary

*Yongjae Lee[1] (1. Yonsei University)

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

[R3-12] Sound velocity of B2-FeNiSi alloy at high pressure and high temperature and constitution of the Earth's inner core

*Eiji OHTANI[1], Daijo IKUTA[2], Hiroshi FUKUI[3,4], Tatsuya SAKAMAKI[1], Daisuke Ishikawa[3,4], Alfred Q. R. BARON[3,4] (1. Tohoku University, 2. Institute for Planetary Materials, Okayama University, 3. JASRI, 4. RIKEN)

3:00 PM - 3:15 PM JST | 6:00 AM - 6:15 AM UTC

[R3-13] On the phase boundary between FeS IV and V

*Satoru URAKAWA[1] (1. Okayama University)

Electrical conductivity of the lower mantle materials under high pressure with implication for valence and spin states of iron

*Izumi MASHINO[1]

1. Okayama Univ.

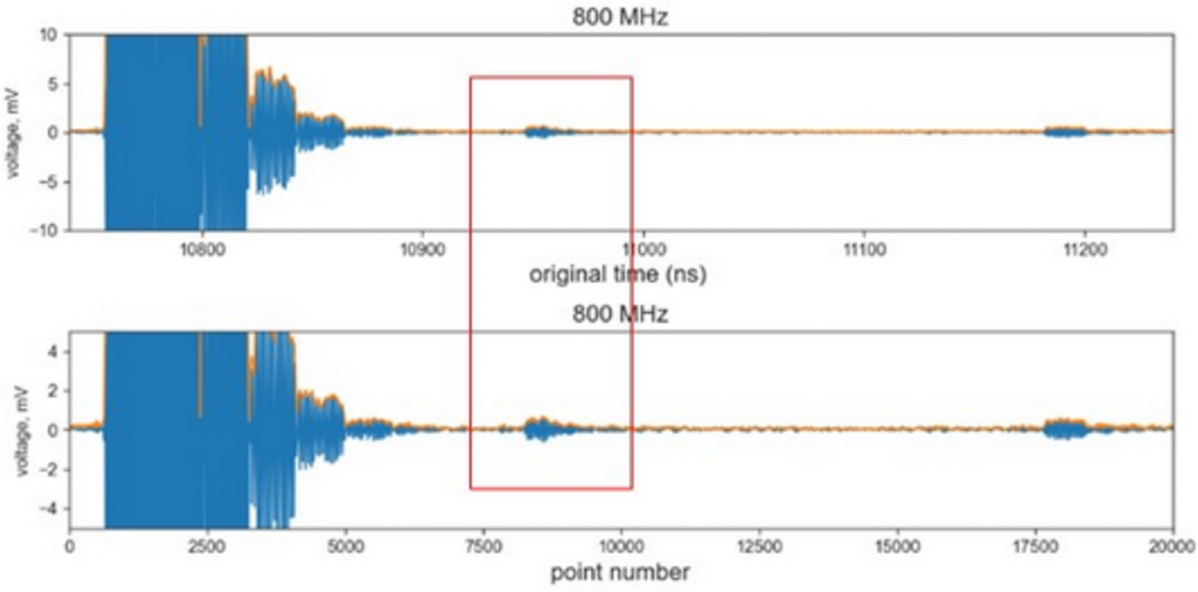
Keywords: Spin transition, The lower mantle, Electrical conductivity

GHz-DAC ultrasonics to measure elastic anomaly with the spin transition of ferrous ion in ferropericlase

*Akira Yoneda[1], Izumi Mashino[2], Ryosuke Matsui[1], Ryoma Ishida[1], Tadashi Kondo[1]

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

Keywords: GHz-DAC ultrasonics, Spin transition, feropericlase



Reaction between water and iron in the early magma ocean and the present core-mantle boundary

*Yongjae Lee[1]

1. Yonsei University

Recent interest in hydrogen as a clean geological resource has been escalating, leading to active research on the formation and exploration of natural hydrogen worldwide. Paradoxically, however, hydrogen is the most abundant element in the universe and is also widely distributed in the Earth, as contained in mineral structures from the crust to the core. Hydrogen in minerals can exist in the form of molecular water (H2O), hydroxyl group (OH), or monatomic hydrogen (H), and is, therefore, directly related to the global transport and distribution of water. From this perspective, it is notable that the hydrogen budget increases innards to the mantle transition zone, lower mantle, and core, compared to the amount in the hydrosphere on the Earth’ s surface. In this presentation, I will introduce the reactions between water and iron based on two recent experimental results to simulate the conditions of the early magma ocean [1] and the present core-mantle boundary [2], which could be linked to the initial distribution of hydrogen and its enrichment in the topmost outer core.

[1] J. Choi, R.J. Husband, H. Hwang, T. Kim, Y. Bang, S. Yun, J. Lee, H. Sim, S. Kim, D. Nam, B. Chae, H.-P. Liermann, Y. Lee*, Oxidation of iron by giant impact and its implication on the formation of reduced atmosphere in the early Earth, Science Advances, Vol.9, eadi6096, 2023
[2] T. Kim, J.G. O’ Rourke, J. Lee, S. Chariton, V. Prakapenka, R.J. Husband, N. Giordano, H.-P. Liermann, S.-H. Shim*, Y. Lee*, “A hydrogen-enriched layer in the topmost outer core sourced from deeply subducted water”, Nature Geoscience, Vol.16, 1208-1214, 2023

Keywords: Hydrogen, Magma ocean, Core-mantle boundary

Sound velocity of B2-FeNiSi alloy at high pressure and high temperature and constitution of the Earth’s inner core

*Eiji OHTANI[1], Daijo IKUTA[2], Hiroshi FUKUI[3,4], Tatsuya SAKAMAKI[1], Daisuke Ishikawa[3,4], Alfred Q. R. BARON[3,4]

1. Tohoku University, 2. Institute for Planetary Materials, Okayama University, 3. JASRI, 4. RIKEN

Elastic properties of an ordered derivative of the body-cantered cubic (B2) structure of Fe-7wt% Ni-15wt% Si ($Fe_{0.67}Ni_{0.06}Si_{0.27}$) alloy have been investigated by combining high-resolution inelastic X-ray scattering and powder X-ray diffraction in diamond anvil cells up to 130 GPa and 2300 K. The density (ρ)-compressional wave velocity (V_P) relation of this phase shows a weak or almost negligible temperature dependence, similar to that observed for the body-centered cubic phase of pure iron (Shibazaki et al, 2016) and the B20 phase of iron-silicon alloys (Whitaker et al., 2009). The ρ, V_P and shear wave velocity (V_S) were extrapolated to the inner core conditions and compared with the PREM (preliminary reference Earth model) inner core (Dziewonski and Anderson, 1981). The phase relation of the Fe-Ni-Si system revealed that B2-Fe-7wt% Ni-15wt% Si alloy coexists with hexagonal close-packed (hcp) Fe-Ni alloys with negligible amount of silicon (Ikuta et al., 2021). The V_P and V_S of the two-phase mixture of B2 and hcp phases under the inner core conditions show slightly higher V_P and V_S compared to the PREM inner core. The two-phase mixture with the addition of a small amount of sulfur could potentially explain the properties of the PREM inner core.

Keywords: Sound velocity, B2-FeNiSi alloy, High pressure and high temperature, Inner core

On the phase boundary between FeS IV and V

*Satoru URAKAWA[1]

1. Okayama University

Keywords: iron sulfide, second order phase transition, thermal expansivity, high pressure, X-ray diffraction

Oral presentation | R8: Metamorphic rocks and tectonics

Thu. Sep 12, 2024 3:30 PM - 6:00 PM JST | Thu. Sep 12, 2024 6:30 AM - 9:00 AM UTC | ES024 Higashiyama Campus

R8: Metamorphic rocks and tectonics

Chairperson:Yui Kouketsu(Nagoya University), Shunsuke Endo

3:30 PM - 3:45 PM JST | 6:30 AM - 6:45 AM UTC

[R8-01] Toward the establishment of "EBSD method for the detection of quartz with phase transition to coesite": Incorporation of the Gongen area, Sanbagawa metamorphic belt, Shikoku, SW-Japan

「発表賞エントリー」

*Momoko Minowa[1], Takayoshi Nagaya[1], Taisuke Ito[2], Simon Wallis[2] (1. Tokyo Gakugei University, 2. The University of Tokyo)

3:45 PM - 4:00 PM JST | 6:45 AM - 7:00 AM UTC

[R8-02] Pressure-Temperature-Time Conditions of The Basement Rocks in The Banggai-Sula Microcontinent, Indonesia

「発表賞エントリー」

*Fransiska Ayuni Catur Wahyuandari[1], Nobuhiko Nakano[1], Tatsuro Adachi[1], Nugroho Imam Setiawan[2] (1. Kyushu Univ., 2. Gadjah Mada Univ.)

4:00 PM - 4:15 PM JST | 7:00 AM - 7:15 AM UTC

[R8-03] Amphibolites from the Mineoka belt revisited

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

4:15 PM - 4:30 PM JST | 7:15 AM - 7:30 AM UTC

[R8-04] Compositional heterogeneity of garnet in garnet-biotite felsic granulite, Czech Republic

*Daisuke NAKAMURA[1], Yuuka FUJIMURA[1], Yuuki KODERA[1] (1. Okayama University)

4:30 PM - 4:45 PM JST | 7:30 AM - 7:45 AM UTC

[R8-05] Formation and alteration of a zoned calcsilicate vein from the contact aureole of Kasuga area, central Japan: insights from chemical ages of U-Th oxides

*Shunsuke ENDO[1] (1. Shimane University)

4:45 PM - 5:00 PM JST | 7:45 AM - 8:00 AM UTC

[R8-06] Observations of geological structures and microstructures associated with strain release at a continental plate boundary fault

「発表賞エントリー」

*Haruki Yoshiasa[1], Jun-ichi Ando[1,2], Kaushik Das[1,2], Dyuti Prakash Sarkar[3] (1. Hiroshima University, 2. HiPeR, 3. JAMSTEC)

5:00 PM - 5:15 PM JST | 8:00 AM - 8:15 AM UTC

[R8-07] Comparison and verification study of new sample forms for use in Raman carbonaceous material geothermometer

「発表賞エントリー」

*Shunsuke Ogino[1], Yui Kouketsu[1], Satoshi Takahashi[1] (1. Nagoya Univ. Env.)

5:15 PM - 5:30 PM JST | 8:15 AM - 8:30 AM UTC

[R8-08] Pressure and temperature conditions for the occurrence of index minerals in pelitic schists in the Sanbagawa belt, Kanto Mountains, Japan, inferred from Raman carbonaceous material geothermometry

*Yui KOUKETSU[1], Ichiko Shimizu[2] (1. Nagoya Univ. Env., 2. Kyoto Univ. Sci.)

5:30 PM - 5:45 PM JST | 8:30 AM - 8:45 AM UTC

[R8-09] Microstructural and petrological characteristics of the Ryoke mylonite occurred along the Median Tectonic Line in the Shinshiro area, Aichi Prefecture

*Miharu Niwa[1,2], Katsuyoshi Michibayashi[1,3], Kenichiro Tani[4], Takuma Nishimura[5] (1. Nagoya Univ. Env., 2. TMNH, 3. JAMSTEC, 4. NMNS, 5. HMNH)

5:45 PM - 6:00 PM JST | 8:45 AM - 9:00 AM UTC

[R8-10] Re-proposal of the metamorphic zone division in the Horokanai area of the Kamuikotan Belt based on the mineral paragenesis and phengite K-Ar Age.

*Takao HIRAJIMA[1], Kousuke Naemura[2], Kenta Yoshida[3] (1. Kyoto University, 2. Iwate University, 3. JAMSTEC)

Toward the establishment of "EBSD method for the detection of quartz with phase transition to coesite": Incorporation of the Gongen area, Sanbagawa metamorphic belt, Shikoku, SW-Japan

*Momoko Minowa[1], Takayoshi Nagaya[1], Taisuke Ito[2], Simon Wallis[2]

1. Tokyo Gakugei University, 2. The University of Tokyo

Keywords: Sanbagawa metamorphic belt, Gongen area, coesite–quartz phase transition, EBSD (Electron Back Scatter Diffraction), anisotropy

Pressure-Temperature-Time Conditions of The Basement Rocks in The Banggai-Sula Microcontinent, Indonesia

*Fransiska Ayuni Catur Wahyuandari[1], Nobuhiko Nakano[1], Tatsuro Adachi[1], Nugroho Imam Setiawan[2]

1. Kyushu Univ., 2. Gadjah Mada Univ.

The Banggai-Sula microcontinent in the eastern Indonesia region is known to be derived from the Northwest Australia continental margin (Sula Spur). The basement rocks of Banggai-Sula microcontinents are often associated with the high-temperature/low-pressure metamorphic rocks of Kemum Basement High of the Bird’ s Head region in Papua which intruded by granitoids of Devonian–Carboniferous and Permian–Triassic age. This study reports the petrological and geochemical characteristics, and monazite EPMA ages of these basement rocks to understand its origin and the relation with tectonic events along the northeastern margin of Gondwana in the Paleozoic. Metamorphic rocks collected from Banggai and Peleng Islands imply differences in metamorphic conditions between Banggai Island in the east (garnet-andalusite-muscovite schist) and the western part of Peleng Island (garnet-staurolite-biotite-muscovite schist). The preservation of garnet growth zoning during prograde metamorphism is indicated by decreasing Mn from the core towards the rim of the garnet grains obtained from metamorphic rocks in this region. The monazite EPMA ages were determined from biotite granite in Banggai Island and staurolite-bearing pelitic schist in Peleng Island. The biotite granite from Banggai Island gives a weighted mean age of 271 ±8 and 263 ±14 Ma from the core and rim of monazite. The staurolite-bearing pelitic schist from Peleng Island yields a weighted mean age of 434 ±3 and 449 ±12 Ma from the core and mantle, and 403 ±8 Ma from the rim of monazite. This Silurian-Devonian metamorphic age has not been reported before from the Banggai-Sula microcontinent and Eastern Indonesia region. The differences in metamorphic grade and timing with the Kemum Basement High suggest that an earlier tectonic event influenced the metamorphism in the Banggai-Sula microcontinent. Such early Paleozoic igneous activity and metamorphism happened along the northern margin of East Gondwana related to the subduction of the Proto-Tethys Oceanic crust. Silurian–Devonian metamorphism in the Banggai-Sula microcontinent might represent the eastern continuation of this tectonic event. In the presentation, we will also discuss the pressure-temperature conditions of these basement rocks.

Keywords: Banggai-Sula microcontinent, Paleozoic basement, monazite EPMA ages

Amphibolites from the Mineoka belt revisited

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

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

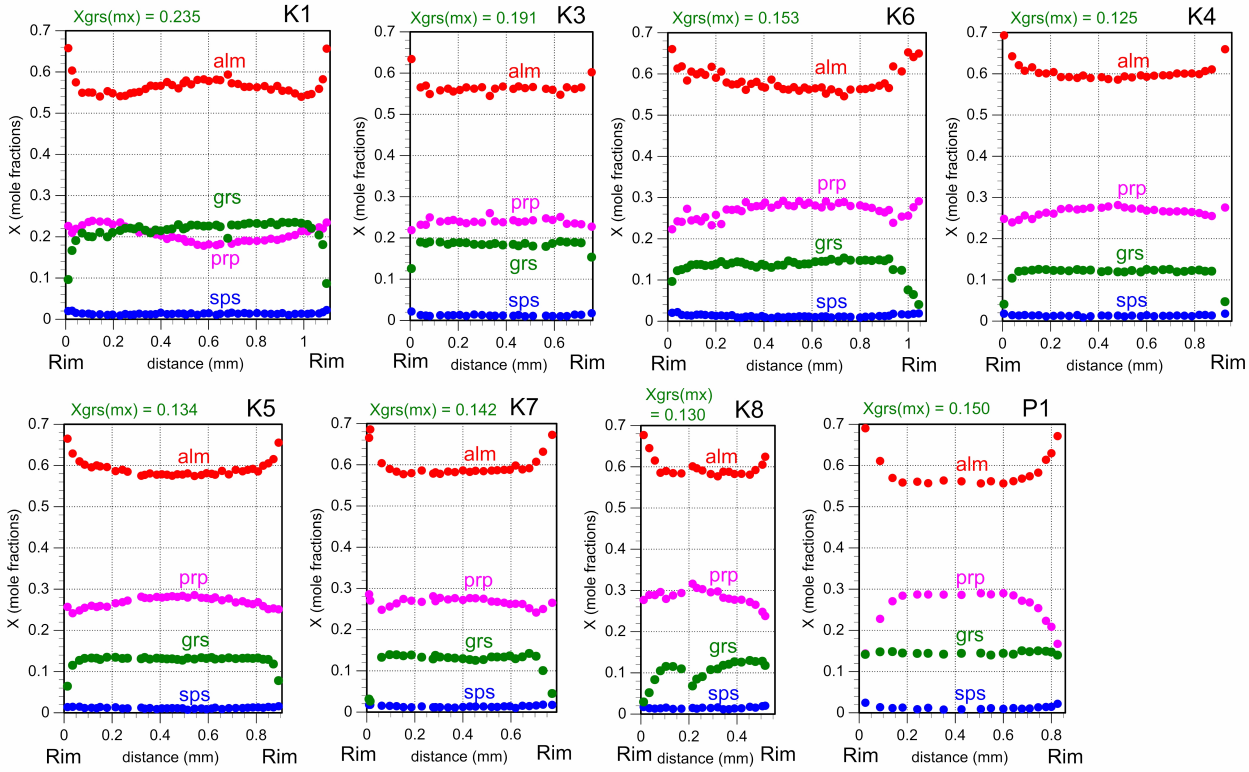
Keywords: Mineoka belt, Amphibolites, Metamorphic sole

Compositional heterogeneity of garnet in garnet-biotite felsic granulite, Czech Republic

*Daisuke NAKAMURA[1], Yuuka FUJIMURA[1], Yuuki KODERA[1]

1. Okayama University

Keywords: Garnet



Formation and alteration of a zoned calcsilicate vein from the contact aureole of Kasuga area, central Japan: insights from chemical ages of U-Th oxides

*Shunsuke ENDO[1]

1. Shimane University

Keywords: Vein

Observations of geological structures and microstructures associated with strain release at a continental plate boundary fault

*Haruki Yoshiasa[1], Jun-ichi Ando[1,2], Kaushik Das[1,2], Dyuti Prakash Sarkar[3]

1. Hiroshima University, 2. HiPeR, 3. JAMSTEC

Keywords: Bedding plane slip, MBT, Microstructure, Frictional heat, Dynamic recrystallization

Comparison and verification study of new sample forms for use in Raman carbonaceous material geothermometer

*Shunsuke Ogino[1], Yui Kouketsu[1], Satoshi Takahashi[1]

1. Nagoya Univ. Env.

Keywords: Carbonaceous material, Raman spectroscopy, Raman CM geothermometer, Mudstone, Pelitic schist

Pressure and temperature conditions for the occurrence of index minerals in pelitic schists in the Sanbagawa belt, Kanto Mountains, Japan, inferred from Raman carbonaceous material geothermometry

*Yui KOUKETSU[1], Ichiko Shimizu[2]

1. Nagoya Univ. Env., 2. Kyoto Univ. Sci.

The Sanbagawa belt in the Kanto Mountains has long been studied as a type locality for the Sanbagawa metamorphic belt, but the occurrence of index minerals and the graphitization degree (GD) show a complicated distribution, and the boundaries of isograd vary among researchers. In this study, we applied Raman carbonaceous material (CM) geothermometry to pelitic and siliceous schists collected in the Ayukawa-Sanbagawa area to estimate their temperature structures, and conducted pseudosection modelling to analyze the stability field of index minerals, such as garnet, biotite, and oligoclase. The application of Raman CM geothermometer to the Ayukawa-Sanbagawa area resulted in temperatures ranging from 360˚C to 520˚C: Chlorite zone is about 400-440˚C, Garnet zone is about 360-470˚C, and Biotite zone is about 470-520˚C, respectively. A pseudosection diagram of the pelitic schist of the Biotite zone (AM41P, Miyashita 1997), which shows the average bulk rock composition of the Kanto Sanbagawa belt, shows that garnet, biotite, and oligoclase occur with increasing temperature. The stability field of garnet strongly affected by the bulk rock composition of MnO, as shown in previous studies, which explains the overlap of the temperature ranges of the Chlorite and Garnet zones. Compared with the temperature data, the biotite zone in the Kanto Mountains was formed at about 0.8 GPa, and may have experienced lower pressure conditions than the Shikoku. Oligoclase ($X_{An} > 0.1$) appears at about +20-30˚C after the appearance of biotite under low pressure conditions up to about 0.9 GPa, but the stability field tends to shift to the higher temperature side under high pressure conditions above 0.9 GPa. This result is consistent with the hypothesis that there is a pressure difference between the Kanto Mountains, where the oligoclase appears homogenously in the biotite zone, and the Shikoku, where the Albite-biotite zone and the Oligocase-biotite zone are clearly separated.

Keywords: Raman carbonaceous material geothermometry, Pseudosection modelling, Garnet, Biotite, Oligoclase

Microstructural and petrological characteristics of the Ryoke mylonite occurred along the Median Tectonic Line in the Shinshiro area, Aichi Prefecture

*Miharu Niwa[1,2], Katsuyoshi Michibayashi[1,3], Kenichiro Tani[4], Takuma Nishimura[5]

1. Nagoya Univ. Env., 2. TMNH, 3. JAMSTEC, 4. NMNS, 5. HMNH

The Median Tectonic Line (MTL) in Shinshiro City, Higashimikawa area, Aichi Prefecture, has a complex geology, with the Ryoke metamorphic rocks and plutonic rocks in the inner zone, the Sambagawa metamorphic rocks in the outer zone, and the Shidara Group that overlie the basement rocks. Although the fault rocks are exposed in this area along the MTL as like in Nagano, Shizuoka and Mie Prefecture, detail structural and petrological reports are rare compared to other areas. The fault rocks in this area are mostly cataclasite, and mylonite has been found near in the Horai-cho, Shinshiro City, we found continuous outcrops of mylonite in the Sakurabuchi Park, Shinshiro City, furter southwest from Hoai-cho. In this study, we observed microstructure with polarized light microscope, measured quartz crystal orientation with SEM-EBSD system, analyzed geochronological, in order to estimate deformation temperature, shear sense, and original rocks. Mylonite in this area is greenish-white in outcrop, and is characterized plagioclase porphyroclasts with white spots, as like Kashio mylonite. There are tonalitic rocks, composing of main constituently minerals, quartz, plagioclase, and biotite, with minor amount of K-feldspar, allanite, and zircon. The microstructure consists of a typical porphyroclastic texture composing of coarse-grained plagioclase and an asymmetric texture with plagioclase and fine quartz strain shadows. The quartz c-axis fabric shows a pattern of Y-maxima, which is formed at relatively intermediate temperature during deformation. In combination with the plagioclase-quartz porphyroclasts structure, which shows deformation during the progressive retrogression period, it is inferred that the quartz was formed by plastic shear deformation during the peak temperature from 350-450℃. Furthermore, the shear sense of the mylonite along the MTL, which is common in Nagano Prefecture, shows sinistral shear sense, whereas the shear sense of the mylonite in this area shows dextral shear sense.Based on these results, we discuss the regional structural characteristics of the Mikawa area in comparison with other areas.

Keywords: Mylonite, Median Tectonic Line, Ryoke belt, Fault rock

Re-proposal of the metamorphic zone division in the Horokanai area of the Kamuikotan Belt based on the mineral paragenesis and phengite K-Ar Age.

*Takao HIRAJIMA[1], Kousuke Naemura[2], Kenta Yoshida[3]

1. Kyoto University, 2. Iwate University, 3. JAMSTEC

According to the K-Ar age of phengite (Phn) and the deformation style of the rock, Sakakibara et al. (2007) proposed a zone division in the Horokanai area of the Kamuikotan belt, such as Horokanai unit (HKU) characterized by the occurrence of blueschist (BS) with Phn K-Ar ages of 135-120 Ma, and Biei unit (BIU) by the missing of BS and Phn K-Ar ages of 115-100 Ma. However, we confirmed the occurrence of BS from Mt. Shirakke through Jyari River to Mt. Numaushi, where Sakakibara et al. (2007) classified as BIU, in addition, the Phn K-Ar dating in the area has not been reported.To clarify these inconsistencies, we performed Phn K-Ar dating collected from the Jyari River and Mt. Numashi and their surrounding area. The results are as follows:HKU: EP256: Etanbetsu Pass, 115.1Ma, KD12/KD13: Numaushi River East, 123.3/106.6Ma, 126.9/101.8Ma.BIU: KHK121: Mt. NUmaushi,120.2Ma, KHK331/KHK333: Jyari-River, 109.2Ma/105.6Ma. Since Phns in the studied BS are generally fine-grained, the particle size of the dated fraction was adjusted to 0.2-2 micron and coarse-grained (50-120 micron) Phn fractions in KD12/KD13 were also dated. The coarse-grained fraction of KD12/KD13 showed 123.3/126.9 Ma, and their fine-grained fractions were 106.6/101.8 Ma, and the difference reached 12-25 Ma. The phenomenon of younger fine-grained fractions has also been confirmed in a few reports (Kurosegawa, Sato et al., 2014; Kanto Mountains, Lu et al., 2022), and there are various theories as to why. In order to eliminate the influence of particle size, the fine-grained fraction age is considered, i.e., 115.1~106.6 Ma for HKU and 120.2~105.6 for BIU. Phn K-Ar ages (107-102 Ma) reported from BS missing area of BIU also overlap with abovementioned BS ages (120-101Ma). Therefore, the blueschist occurrence region, which Sakakibara et al. (2007) regarded as the Biei unit, has lost the reason to distinguish it from the Horokanai unit in terms of mineral combination and metamorphic age.

Keywords: Phengite K-Ar age, Triple Point bluecshit, Horokanai area, Kamuikotan Belt

Oral presentation | S3: Rheology and Material Transfer in Mantle and Crust (Special Session)

Thu. Sep 12, 2024 3:30 PM - 6:00 PM JST | Thu. Sep 12, 2024 6:30 AM - 9:00 AM UTC | ES025 Higashiyama Campus

S3: Rheology and Material Transfer in Mantle and Crust (Special Session)

Chairperson:Ikuo Katayama(Hiroshima University), Katsuyoshi Michibayashi(Nagoya University)

3:30 PM - 3:50 PM JST | 6:30 AM - 6:50 AM UTC

[S3-01] High-speed time-resolved in-situ stress-strain measurements under high pressure and high temperature using synchrotron radiation X-rays

「招待講演」

*Noriyosi TSUJINO[1] (1. JASRI)

3:50 PM - 4:05 PM JST | 6:50 AM - 7:05 AM UTC

[S3-02] Deformation-induced crystallographic-preferred orientation of ε-FeOOH

*Yu NISHIHARA[1], Yui MORI[1], Wentian WU[1], Noriyoshi TSUJINO[2] (1. GRC, Ehime Univ., 2. JASRI)

4:05 PM - 4:20 PM JST | 7:05 AM - 7:20 AM UTC

[S3-03] Strength of metastable olivine and the rheology of subducting cold slab at mantle transition zone

「発表賞エントリー」

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

4:20 PM - 4:40 PM JST | 7:20 AM - 7:40 AM UTC

[S3-04] High-resolution measurement of ice anelasticity over a broad frequency range with a new cryogenic forced oscillation apparatus

「招待講演」

*Hatsuki Yamauchi[1], Christine McCarthy[1], Benjamin Holtzman[1], David Goldsby[2], Travis Hager[2] (1. Columbia Univ. LDEO, 2. U. Penn)

4:40 PM - 4:55 PM JST | 7:40 AM - 7:55 AM UTC

[S3-05] Relationship between creep and grain growth in rock with bicontinuous structure

「発表賞エントリー」

*Shenghao Jiang[1], Takehiko Hiraga[1] (1. The University of Tokyo)

4:55 PM - 5:10 PM JST | 7:55 AM - 8:10 AM UTC

[S3-06] Microstructures of plagioclase in gabbroic ultramylonites and quadruple point analysis

*Itsuki Natsume[1], Katsuyoshi Michibayashi[2,3], Yohei Igami[4] (1. Kanagawa Prefectural Museum of Natural History, 2. Nagoya Univ., 3. JAMSTEC, 4. Kyoto Univ.)

5:10 PM - 5:25 PM JST | 8:10 AM - 8:25 AM UTC

[S3-07] Reconstruction of the uppermost mantle continuous structure of the Oman ophiolite

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5:25 PM - 5:40 PM JST | 8:25 AM - 8:40 AM UTC

[S3-08] Deformation and melt-rock interaction in the Horoman peridotite: Petrological and structual study of the MHL suite and BDH suite rocks

「発表賞エントリー」

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5:40 PM - 5:55 PM JST | 8:40 AM - 8:55 AM UTC

[S3-09] Multicomponent measurements of seismic velocity and electrical resistivity using foliated serpentinite and peridotite

「発表賞エントリー」

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5:55 PM - 6:00 PM JST | 8:55 AM - 9:00 AM UTC

調整

High-speed time-resolved in-situ stress-strain measurements under high pressure and high temperature using synchrotron radiation X-rays

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Keywords: High pressure, High-speed time-resolution, In-situ measurement, Rheology

Deformation-induced crystallographic-preferred orientation of ε -FeOOH

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Keywords: Crystallographic-preferred orientation, Seismic anisotropy, ε -FeOOH

Strength of metastable olivine and the rheology of subducting cold slab at mantle transition zone

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Keywords: metastable olivine, Peierls mechanism, deep slab, high-pressure deformation experiments, deep-focus earthquake

High-resolution measurement of ice anelasticity over a broad frequency range with a new cryogenic forced oscillation apparatus

*Hatsuki Yamauchi[1], Christine McCarthy[1], Benjamin Holtzman[1], David Goldsby[2], Travis Hager[2]

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Keywords: ice, anelasticity, attenuation

Relationship between creep and grain growth in rock with bicontinuous structure

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Keywords: Forsterite, Diopside

Microstructures of plagioclase in gabbroic ultramylonites and quadruple point analysis

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Keywords: Quadruple points, Microstructure, Plagioclase, Ultramylonite

Reconstruction of the uppermost mantle continuous structure of the Oman ophiolite

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Keywords: mantle flow, Oman ophiolite, peridotite, foliation, Crystallographic Preferred Orientation (CPO)

Deformation and melt-rock interaction in the Horoman peridotite: Petrological and structual study of the MHL suite and BDH suite rocks

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Keywords: mantle, peridotite, deformation, crystallographic preferred orientation, EBSD

Multicomponent measurements of seismic velocity and electrical resistivity using foliated serpentinite and peridotite

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Water is involved in various phenomena at subduction zones. When a subducting plate releases water into the mantle wedge, the water reacts with the mantle to form serpentinite. Seismic low velocity and high electrical resistivity in the mantle have been interpreted as mantle hydration; however, these geophysical data can be highly anisotropic. In this study, we performed multicomponent measurments of seismic velocity and electrical resistivity of the foliated serpentinite and peridotite to discuss the fluid movement and mantle hydration at subduction zones.The rocks used in this study are serpentinite and peridotite with the x-axis is parallel to the lineation and the z-axis is normal to the foliation. An intravessel deformation and fluid flow apparatus was used to measure seismic velocity and electrical resistivity at the confining pressures ranging from 5 MPa to 200 MPa. The fluid used was a 0.5 mol/L NaCl solution, and the fluid pressure was controlled at 1 MPa. These measurements represent the physical properties of the rocks, including microcracks. We also measured the crystal orientation using EBSD to evaluate the anisotropy of the minerals. Serpentinite and peridotite show higher P-wave velocity in the x- and y-axes than in the z-axis, although the P-wave velocity of serpentinite is nearly the same in the x- and y-axes. These results are most likely due to crack alignments subparallel to the foliation and crystal preferred orientation. The electrical resistivity of serpentinite tends to be about an order of magnitude lower in the x-axis than in the z-axis, while the electrical resistivity of peridotite is almost the same in the z- and x-axes. From the multicomponent seismic velocities, we calculated the elastic constant tensor and produced pole figures of seismic velocity (Mainprice, 2014). We will discuss these data in more detail with application to seismic tomography and electrical resistivity data at subduction zones.

Keywords: Ultramafic rocks, Seismic velocity, Electrical resistivity, Anisotropy