

**Sat. Sep 14, 2024**

Poster presentation | R2: Crystal structure, crystal chemistry, physical properties of minerals, crystal growth and applied mineralogy

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC | Entrance Hall Higashiyama Campus

**R2: Crystal structure, crystal chemistry, physical properties of minerals, crystal growth and applied mineralogy**

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-01] Advanced four-circle goniometer system for single-crystal diffraction measurements at BL-10A, PF: anomalous X-ray scattering method &amp; in situ high-pressure experiments

\*Takahiro KURIBAYASHI<sup>1</sup>, Ryo Yamane<sup>2</sup>, Keita Harada<sup>1</sup>, Toshiro Nagase<sup>3</sup>, Kazumasa Sugiyama<sup>2</sup> (1. Tohoku University (Sci), 2. Tohoku University (IMR), 3. Tohoku University (Mus))

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-02] Fine Structural Analysis using Single-Crystal Anomalous X-ray Scattering in KEK Photon Factory BL-6C

\*Makoto TOKUDA<sup>1</sup>, Takumi Ichimura<sup>2</sup>, Koichi Momma<sup>6</sup>, Ritsuro Miyawaki<sup>6</sup>, Takashi Mikouchi<sup>4</sup>, Akira Yoshiasa<sup>3</sup>, Kazumasa Sugiyama<sup>5</sup> (1. IINa, Kumamoto Univ., 2. Tohoku Univ. Eng., 3. Kumamoto Univ. Sci., 4. Univ. of Tokyo UMUT, 5. IMR, Tohoku Univ., 6. Nat'l. Mus. Nat. Sci.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-03] Evaluation of Fe K-edge XANES anisotropy and accurate determination of micro-area Fe<sup>2+</sup>/Fe<sup>3+</sup> in clinopyroxene using multivariate analysis

「発表賞エントリー」

\*Taisuke Ito<sup>1</sup>, Simon Richard Wallis<sup>1</sup>, Yoshio Takahashi<sup>1</sup> (1. The Univ. of Tokyo, EPS)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-04] Fine structural analysis of Diopside (Violan) containing Mn and Fe

「発表賞エントリー」

\*Hayato Chiba<sup>1</sup>, Kazumasa Sugiyama<sup>2</sup>, Makoto Tokuda<sup>3</sup>, Takashi Mikouchi<sup>4</sup> (1. Tohoku Univ. Eng., 2. Tohoku Univ. IMR, 3. Kumamoto Univ. IINa, 4. UMUT)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-05] Single-crystal X-ray diffraction study of a largely Cs-exchanged natural Ca-chabazite: crystal-chemical factors for its excellent Cs-exchange ability

Naomi KAWATA<sup>1</sup>, Ryo FURUHASHI<sup>1</sup>, Keiko FUJIWARA<sup>1</sup>, Makio OHKAWA<sup>2</sup>, \*Akihiko NAKATSUKA<sup>1</sup> (1. Yamaguchi Univ. Sci. Tech. Innov., 2. Hiroshima Univ. Adv. Sci. Eng.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-06] Distribution of Mn<sup>3+</sup> and Mn<sup>4+</sup> studied by X anomalous scattering: the details of 3×4 tunneled structure formed by MnO<sub>6</sub> octahedron in woodruffite

「発表賞エントリー」

\*Christopher Miyazaki<sup>1</sup>, Ryo Yamane<sup>2</sup>, Kazumasa Sugiyama<sup>2</sup>, Makoto Tokuda<sup>3</sup>, Takeshi Mikouchi<sup>4</sup> (1. Tohoku Univ. Eng., 2. Tohoku Univ. IMR, 3. Kumamoto Univ. IINa, 4. UMUT)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-07] Mg<sup>2+</sup> and Ba<sup>2+</sup> ion-exchange of GTS-type Na titanosilicate and its structural characterization\*Keiko FUJIWARA<sup>1</sup>, Naomi Kawata<sup>1</sup>, Akihiko Nakatsuka<sup>1</sup> (1. Yamaguchi Univ. Sci. Tech. Innov.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-08] Distribution of Fe<sup>3+</sup> among tetrahedral sites and crystal structural change of gehlenite-Fe<sup>3+</sup> gehlenite\*Maki HAMADA<sup>1</sup>, Mariko Nagashima<sup>2</sup> (1. Kanazawa University, 2. Yamaguchi University)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-09] Crystallographic site preference of impurity elements in olivine by ALCHEMI method

\*Yohei IGAMI<sup>1</sup>, Akira MIYAKE<sup>1</sup>, Ryo WAKABAYASHI<sup>1</sup>, Norikatsu AKIZAWA<sup>2</sup> (1. Kyoto University, 2. The University of Tokyo)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-10] Precipitated structures of pyroxene lamellar with various directions

\*Shoichi TOH<sup>1</sup> (1. Fukuoka University)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-11] Crystal chemistry of bridgmanite with Al/Fe contents expected in MORB component

\*Akihiko NAKATSUKA<sup>1</sup>, Hiroshi FUKUI<sup>2</sup>, Seiji KAMADA<sup>3</sup>, Naohisa HIRAO<sup>2</sup>, Makio OHKAWA<sup>4</sup>, Kazumasa SUGIYAMA<sup>5</sup>, Takashi YOSHINO<sup>6</sup> (1. Yamaguchi Univ. Sci. Tech. Innov., 2. JASRI, 3. AD Science Inc., 4. Hiroshima Univ. Adv. Sci. Eng., 5. Tohoku Univ. IMR, 6. Okayama Univ. IPM)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-12] Mechanism of the pressure-induced crystallization of amorphous calcium carbonate

\*Chiho Morita<sup>1</sup>, Hiroki Kobayashi<sup>1</sup>, Hiroyuki Kagi<sup>1</sup> (1. UTokyo. Sci.)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-13] Differences in the effects of Li and Cs on the calcitization of vaterite.

\*Noboru FURUKAWA<sup>1</sup>, Ami Kinoda<sup>2</sup> (1. Chiba University, 2. NIWAKA)

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Poster presentation | R5: Extraterrestrial materials

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC | Entrance Hall Higashiyama Campus

### R5: Extraterrestrial materials

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-01] Dehydration of Newberyite( $\text{MgHPO}_4 \cdot 3\text{H}_2\text{O}$ ) under low pressures

\*Yukako Matsumoto<sup>1</sup>, Shogo Tachibana<sup>1</sup> (1. UTokyo)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-02] Experimental simulation of oxygen isotope exchange between chondrule melt and low-pressure water vapor

\*Daiki YAMAMOTO<sup>1</sup>, Noriyuki Kawasaki<sup>2</sup> (1. Kyushu University, 2. Hokkaido University)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-03] Early impact events recorded in anomalous eucrites

\*Akira YAMAGUCHI<sup>1</sup> (1. National Institute of Polar Research)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-04] Internal Structure Analysis of Carbonaceous Material in Yamato 8448 Ureilite

\*Masahiro YASUTAKE<sup>1</sup>, Megumi Matsumoto<sup>2</sup>, Akira Tsuchiyama<sup>3,4</sup>, Kentaro Uesugi<sup>1</sup>, Akihisa Takeuchi<sup>1</sup>, Akira Yamaguchi<sup>5</sup> (1. JASRI, 2. Tohoku Univ., 3. Ritsumeikan Univ., 4. CAS/GIG, 5. NIPR)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-05] Effects of initial porosity on shock deformation microstructures in rutile

\*Yuhei Umeda<sup>1,2</sup>, Yuma Nagai<sup>1,2</sup>, Naotaka Tomioka<sup>3</sup>, Toshimori Sekine<sup>4</sup>, Masashi Miyakawa<sup>5</sup>, Takamichi Kobayashi<sup>5</sup>, Hitoshi Yusa<sup>5</sup>, Takuo Okuchi<sup>1,2</sup> (1. KURNS, 2. Kyoto Univ. Eng., 3. JAMSTEC, 4. HPSTAR, 5. NIMS)

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

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC | Entrance Hall Higashiyama Campus

**R6: Plutonic rocks, volcanic rocks and subduction factory**

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-01] Orthopyroxene cumulates from a serpentinite mud-volcano in the Mariana forearc: constituent rocks of the forearc Moho transition zone

\*Pia Ataka<sup>1</sup>, Yuji Ichiyama<sup>1</sup>, Shun Takamizawa<sup>1</sup>, Akihiro Tamura<sup>2</sup>, Tomoaki Motishita<sup>2</sup> (1. Chiba University, 2. Kanazawa University)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-02] Formation processes of high-Mg andesite associated with ophiolitic rocks in the Setogawa belt

\*Tsumugi Kato<sup>1</sup>, Yuji Ichiyama<sup>1</sup>, Akihiro Tamura<sup>2</sup>, Tomoaki Morishita<sup>2</sup> (1. Chiba Univ., 2. Kanazawa Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-03] Petrological and geochemical study of volcanics from Kuju volcanic group, Kyushu Island, Southwest Japan Arc.

「発表賞エントリー」

\*Soma Yamanaka<sup>1</sup>, Tomoyuki Shibata<sup>1</sup>, Ryotaro Fujihara<sup>1</sup>, Masako Yoshikawa<sup>1</sup>, Tomo Shibata<sup>2</sup> (1. Hiroshima Univ. Sci. & Tech, 2. Fukuoka Univ. Sci.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-04] Petrological study of intrusive rocks and their crustal xenoliths in the Suzu area, Atsumi district, Yamagata

\*Kazuhiro Tojo<sup>1</sup>, Takashi Hoshida<sup>1</sup> (1. Akita Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-05] Crystallization conditions of zircon and its crystallization relationship with surrounding minerals in the Tono plutonic complex, Kitakami mountains

\*Yasuhiro OGITA<sup>1,2</sup>, Shuhei Sakata<sup>3</sup>, Takeshi Ohno<sup>4</sup>, Tatsunori Yokoyama<sup>2</sup>, Satoshi Suzuki<sup>1</sup>, Kyoka Endo<sup>1</sup>, Takashi Yuguchi<sup>5</sup> (1. Yamagata Univ., 2. JAEA, Tono Geoscience Center, 3. The Univ. Tokyo, Earthquake Research Inst., 4. Gakushuin Univ., 5. Kumamoto Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-06] Petrography and magmatic processes of a diorite body distributed in the Kawakami region, Yamaguchi Prefecture, Japan

「発表賞エントリー」

\*Ryosei Sugiura<sup>1</sup>, Keisuke Eshima<sup>1</sup> (1. Yamaguchi University)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-07] Sr-Nd-Hf isotopic systematics for the Habu granodiorite, eastern part of Yamaguchi Prefecture

\*Masaaki OWADA<sup>1</sup>, Yusaku Akimoto<sup>2</sup>, Mariko Nagashima<sup>1</sup>, Keisuke Eshima<sup>1</sup>, Atsushi Kamei<sup>3</sup>, Nobuhiko Nakano<sup>4</sup>, Kenta Kawaguchi<sup>5</sup>, Yasuhito Osanai<sup>4</sup> (1. Yamaguchi Univ., 2. YON-C, 3. Shimane Uni., 4. Kyushu Univ., 5. Hiroshima Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-08] Rare earth element compositions and U-Pb zircon age of granodiorite porphyrites in the Noko Island, western part of northern Kyushu

\*Masaki YUHARA<sup>1</sup>, Yoshinobu KAWANO<sup>2</sup>, Kazuhiro TSUKADA<sup>3</sup>, Purevdulam SUKHBAATAR<sup>4</sup> (1. Fukuoka Univ. Sci., 2. Rissyo Univ. Env. Sci., 3. Nagoya Univ. Mus., 4. Nagoya Univ. Env. St.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-09] Compositional changes and growth processes of the Asakura granodiorite, Northern Kyushu, Japan.

「発表賞エントリー」

\*Yudai HAMANO<sup>1</sup>, Keisuke ESHIMA<sup>1</sup> (1. Yamaguchi Uni. Sci)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-10] Intrusive relationship and lithofacies classification of Granite–Granodiorite in Eastern Fukuoka Prefecture

「発表賞エントリー」

\*Ryo Nakamura<sup>1</sup>, Keisuke Eshima<sup>1</sup> (1. Yamaguchi University)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-11] Crystallization processes of quartz in a granitic magma: Implications for the magma chamber processes of Okueyama granite, Kyushu, Japan

\*Takashi YUGUCHI<sup>1</sup>, Takenori Kato<sup>4</sup>, Yasuhiro Ogita<sup>2</sup>, Minori Watanabe<sup>6</sup>, Asuka Kato<sup>6</sup>, Daichi Itoh<sup>6</sup>, Tatsunori Yokoyama<sup>2</sup>, Shuhei Sakata<sup>3</sup>, Takeshi Ohno<sup>5</sup> (1. Kumamoto University, 2. JAEA, 3. Uni. Tokyo ERI, 4. Nagoya University, 5. Gakushuin University, 6. Yamagata University)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-13] Differentiation Processes of Granitic Magma Chamber Recorded in 'Oshima-ishi' Distributed in Oshima, Geiyo islands, Ehime Prefecture

\*Kazuya SHIMOOKA<sup>1,2</sup>, Soichiro AONO<sup>2</sup>, Takahito ONISHI<sup>2</sup>, Toko FUKUI<sup>2</sup>, Motohiro TSUBOI<sup>1</sup>, Toshiro TAKAHASHI<sup>3</sup>, Satoshi SAITO<sup>2</sup> (1. Kwansei Gakuin Univ., 2. Ehime Univ., 3. Niigata Univ.)

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[R2-P-02] Fine Structural Analysis using Single-Crystal Anomalous X-ray Scattering in KEK Photon Factory BL-6C

\*Makoto TOKUDA<sup>1</sup>, Takumi Ichimura<sup>2</sup>, Koichi Momma<sup>6</sup>, Ritsuro Miyawaki<sup>6</sup>, Takashi Mikouchi<sup>4</sup>, Akira Yoshiasa<sup>3</sup>, Kazumasa Sugiyama<sup>5</sup> (1. IINa, Kumamoto Univ., 2. Tohoku Univ. Eng, 3. Kumamoto Univ. Sci, 4. Univ. of Tokyo UMUT, 5. IMR, Tohoku Univ., 6. Nat'l. Mus. Nat. Sci.)

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[R2-P-05] Single-crystal X-ray diffraction study of a largely Cs-exchanged natural Ca-chabazite: crystal-chemical factors for its excellent Cs-exchange ability

Naomi KAWATA<sup>1</sup>, Ryo FURUHASHI<sup>1</sup>, Keiko FUJIWARA<sup>1</sup>, Makio OHKAWA<sup>2</sup>, \*Akihiko NAKATSUKA<sup>1</sup> (1. Yamaguchi Univ. Sci. Tech. Innov., 2. Hiroshima Univ. Adv. Sci. Eng.)

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\*Christopher Miyazaki<sup>1</sup>, Ryo Yamane<sup>2</sup>, Kazumasa Sugiyama<sup>2</sup>, Makoto Tokuda<sup>3</sup>, Takeshi Mikouchi<sup>4</sup> (1. Tohoku Univ. Eng., 2. Tohoku Univ. IMR, 3. Kumamoto Univ. IINa, 4. UMUT)

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[R2-P-07] Mg<sup>2+</sup> and Ba<sup>2+</sup> ion-exchange of GTS-type Na titanosilicate and its structural characterization

\*Keiko FUJIWARA<sup>1</sup>, Naomi Kawata<sup>1</sup>, Akihiko Nakatsuka<sup>1</sup> (1. Yamaguchi Univ. Sci. Tech. Innov.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-08] Distribution of Fe<sup>3+</sup> among tetrahedral sites and crystal structural change of gehlenite-Fe<sup>3+</sup> gehlenite

\*Maki HAMADA<sup>1</sup>, Mariko Nagashima<sup>2</sup> (1. Kanazawa University, 2. Yamaguchi University)

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[R2-P-09] Crystallographic site preference of impurity elements in olivine by ALCHEMI method

\*Yohei IGAMI<sup>1</sup>, Akira MIYAKE<sup>1</sup>, Ryo WAKABAYASHI<sup>1</sup>, Norikatsu AKIZAWA<sup>2</sup> (1. Kyoto University, 2. The University of Tokyo)

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[R2-P-10] Precipitated structures of pyroxene lamellar with various directions

\*Shoichi TOH<sup>1</sup> (1. Fukuoka University)

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\*Akihiko NAKATSUKA<sup>1</sup>, Hiroshi FUKUI<sup>2</sup>, Seiji KAMADA<sup>3</sup>, Naohisa HIRAO<sup>2</sup>, Makio OHKAWA<sup>4</sup>, Kazumasa SUGIYAMA<sup>5</sup>, Takashi YOSHINO<sup>6</sup> (1. Yamaguchi Univ. Sci. Tech. Innov., 2. JASRI, 3. AD Science Inc., 4. Hiroshima Univ. Adv. Sci. Eng., 5. Tohoku Univ. IMR, 6. Okayama Univ. IPM)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-12] Mechanism of the pressure-induced crystallization of amorphous calcium carbonate

\*Chiho Morita<sup>1</sup>, Hiroki Kobayashi<sup>1</sup>, Hiroyuki Kagi<sup>1</sup> (1. UTokyo. Sci.)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R2-P-13] Differences in the effects of Li and Cs on the calcitization of vaterite.

\*Noboru FURUKAWA<sup>1</sup>, Ami Kinoda<sup>2</sup> (1. Chiba University, 2. NIWAKA)

## Advanced four-circle goniometer system for single-crystal diffraction measurements at BL-10A, PF: anomalous X-ray scattering method & in situ high-pressure experiments

\*Takahiro KURIBAYASHI<sup>1</sup>, Ryo Yamane<sup>2</sup>, Keita Harada<sup>1</sup>, Toshiro Nagase<sup>3</sup>, Kazumasa Sugiyama<sup>2</sup>

1. Tohoku University (Sci), 2. Tohoku University (IMR), 3. Tohoku University (Mus)

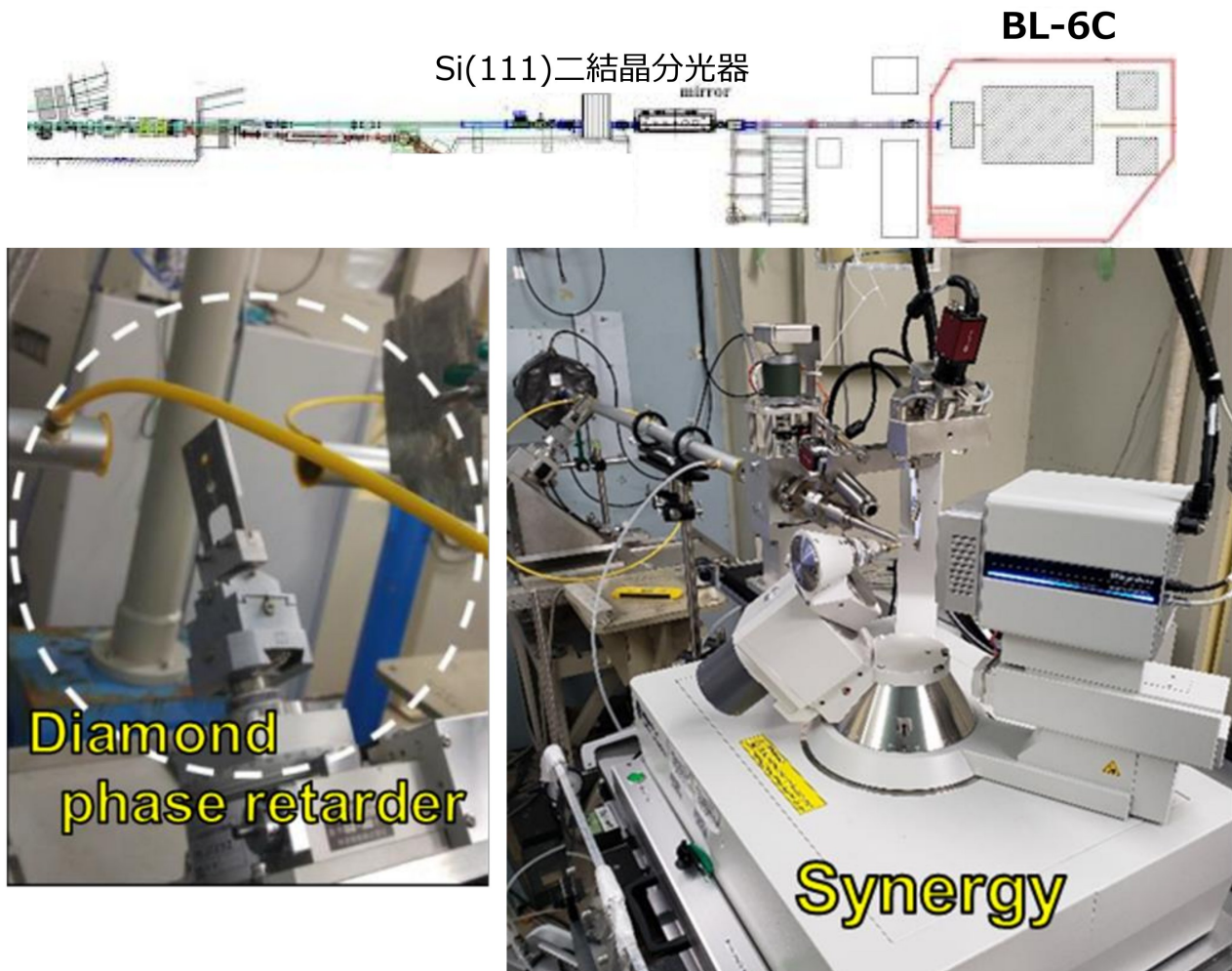
Keywords: anomalous X-ray scattering, In situ single-crystal X-ray diffraction, synchrotron radiation

## Fine Structural Analysis using Single-Crystal Anomalous X-ray Scattering in KEK Photon Factory BL-6C

\*Makoto TOKUDA<sup>1</sup>, Takumi Ichimura<sup>2</sup>, Koichi Momma<sup>6</sup>, Ritsuro Miyawaki<sup>6</sup>, Takashi Mikouchi<sup>4</sup>, Akira Yoshiasa<sup>3</sup>, Kazumasa Sugiyama<sup>5</sup>

1. IINa, Kumamoto Univ., 2. Tohoku Univ. Eng, 3. Kumamoto Univ. Sci, 4. Univ. of Tokyo UMUT, 5. IMR, Tohoku Univ., 6. Nat'l. Mus. Nat. Sci.

Keywords: Anomalous X-ray Scattering, Single-crystal X-ray Diffraction, Element Distribution, Valence-Difference Contrast



## Evaluation of Fe K-edge XANES anisotropy and accurate determination of micro-area Fe<sup>2+</sup>/Fe<sup>3+</sup> in clinopyroxene using multivariate analysis

\*Taisuke Ito<sup>1</sup>, Simon Richard Wallis<sup>1</sup>, Yoshio Takahashi<sup>1</sup>

1. The Univ. of Tokyo, EPS

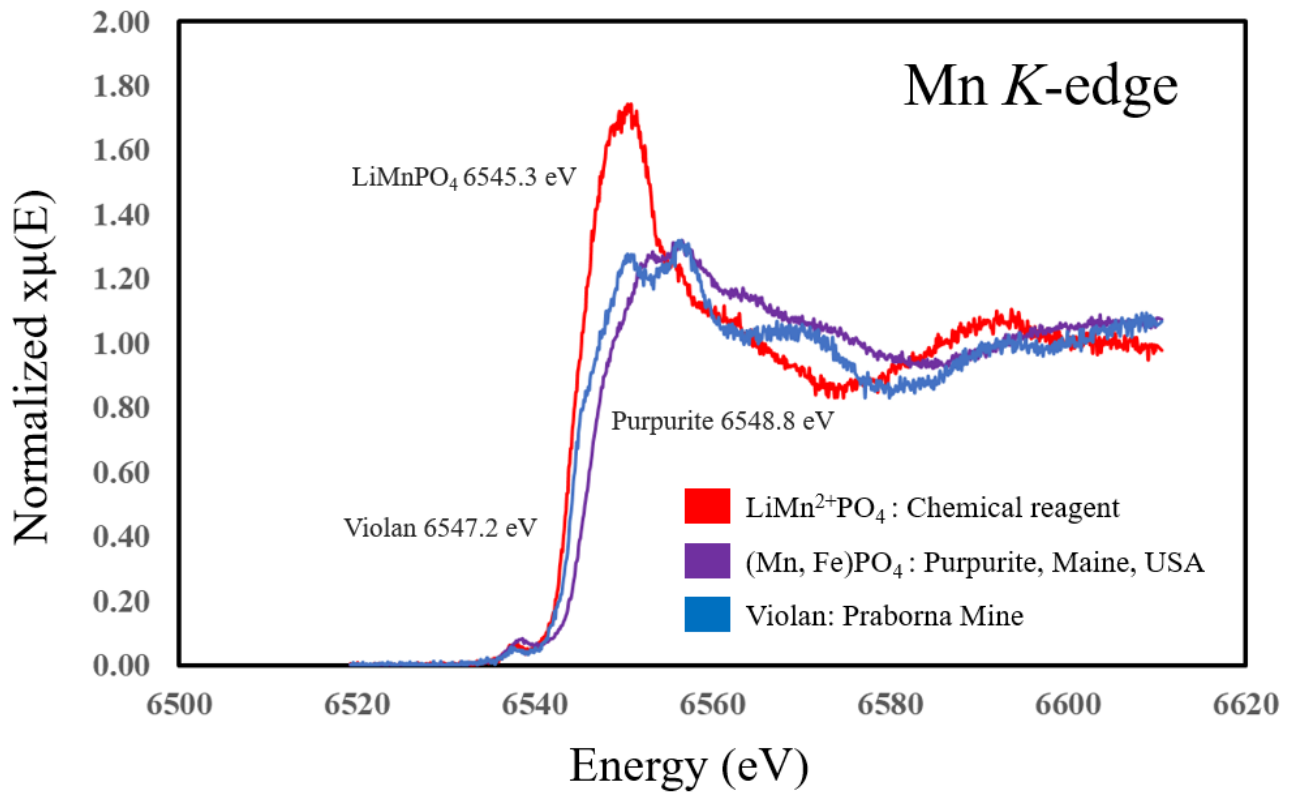
Keywords: XAFS spectroscopy, clinopyroxene, Fe<sup>2+</sup>/Fe<sup>3+</sup>, multivariate analysis

## Fine structural analysis of Diopside (Violan) containing Mn and Fe

\*Hayato Chiba<sup>1</sup>, Kazumasa Sugiyama<sup>2</sup>, Makoto Tokuda<sup>3</sup>, Takashi Mikouchi<sup>4</sup>

1. Tohoku Univ. Eng., 2. Tohoku Univ. IMR, 3. Kumamoto Univ. IINa, 4. UMUT

Keywords: Diopside, Violan, AXS, XANES



## Single-crystal X-ray diffraction study of a largely Cs-exchanged natural Ca-chabazite: crystal-chemical factors for its excellent Cs-exchange ability

Naomi KAWATA<sup>1</sup>, Ryo FURUHASHI<sup>1</sup>, Keiko FUJIWARA<sup>1</sup>, Makio OHKAWA<sup>2</sup>, \*Akihiko NAKATSUKA<sup>1</sup>

1. Yamaguchi Univ. Sci. Tech. Innov., 2. Hiroshima Univ. Adv. Sci. Eng.

The amount of contaminated water generated by the Fukushima Daiichi Nuclear Power Plant accident, caused by the Great East Japan Earthquake (March 11, 2011), continues to increase and has become a serious problem. Among the radioactive elements contained in contaminated water, <sup>137</sup>Cs (30.1 years) and <sup>90</sup>Sr (28.8 years) with a long half-life were released in large quantities by the nuclear accident. The search and development of ion-exchangers for highly efficient recovery and removal of these radioactive elements are eagerly desired. Currently, natural zeolite minerals such as chabazite, mordenite and clinoptilolite are practically utilized at the crippled nuclear power plant as the radioactive element removers. To design and develop highly-effective radioactive element removers, it is significant to reveal the relationship between the crystal structural features and the exchange abilities for radioactive ions. Here we conduct the single-crystal X-ray diffraction study of a hydrated natural Ca-chabazite from Burnt Cabin Creek, Spray, Wheeler Co., Oregon, USA and its largely Cs-exchanged form. The sample compositions are  $(\text{Ca}_{1.86}\text{Na}_{0.13}\text{K}_{0.09})(\text{Al}_{3.98}\text{Si}_{8.03})\text{O}_{24}\cdot 12.38\text{H}_2\text{O}$  for the former and  $(\text{Cs}_{2.66}\text{Ca}_{0.45}\text{Na}_{0.04}\text{K}_{0.10})(\text{Al}_{4.04}\text{Si}_{8.04})\text{O}_{24}\cdot 8.52\text{H}_2\text{O}$  for the latter.

We revealed that the Cs-exchanged form has the essentially ten occupied-sites in extraframework: four water sites (OW2', OW3, OW4, OW5), essentially two Cs sites (Cs1/Cs1', Cs2) and four Ca sites (Ca1, Ca2, Ca3, Ca4). The Cs<sup>+</sup> ions more preferentially occupy the Cs1/Cs1' site, located at/around the centers of the 8-membered ring windows, than the Cs2 site. In terms of interatomic distances, the coordination environments of the extraframework species in the chabazite crystals before and after the Cs-exchange treatment are discussed. In particular, both samples have a common feature that possible hydrogen bonds are relatively weak between water molecules and framework O atoms, whereas those are relatively strong between water molecules. On the basis of these findings, we discuss the crystal-chemical key factors for an excellent Cs-exchange ability of chabazite as a highly efficient radioactive-element remover.

Keywords: Ca-chabazite, Single-crystal X-ray Diffraction, Cs-exchange ability

# Distribution of $Mn^{3+}$ and $Mn^{4+}$ studied by X anomalous scattering: the details of $3 \times 4$ tunneled structure formed by $MnO_6$ octahedron in woodruffite

\*Christopher Miyazaki<sup>1</sup>, Ryo Yamane<sup>2</sup>, Kazumasa Sugiyama<sup>2</sup>, Makoto Tokuda<sup>3</sup>, Takeshi Mikouchi<sup>4</sup>

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Keywords: woodruffite

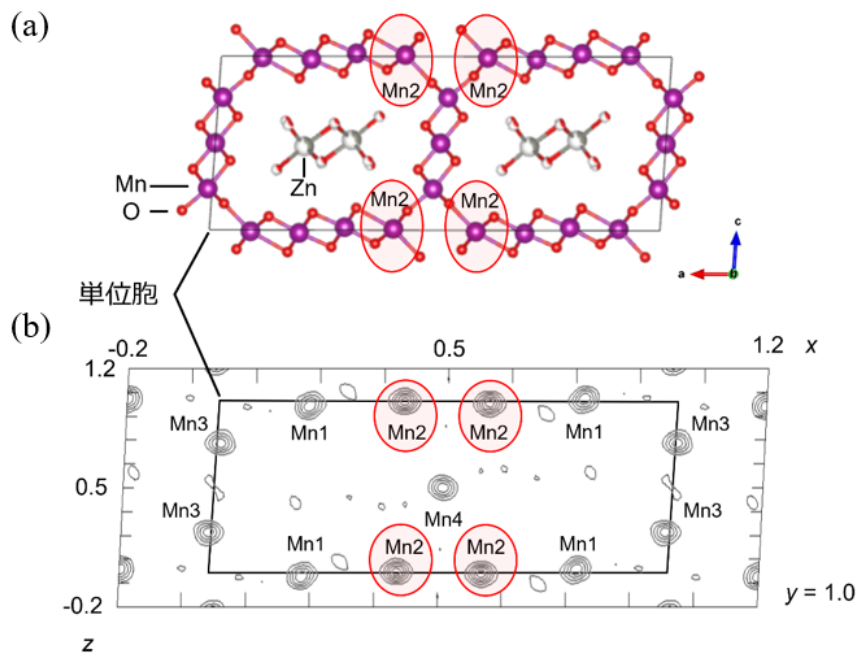


Fig. 1 (a) Woodruffiteの結晶構造 (VESTAにより描画)  
 (b) MnのX線異常散乱によって求めたコントラストマップ (等高線間隔:  $1.2 e/\text{\AA}^3$ )

## Mg<sup>2+</sup> and Ba<sup>2+</sup> ion-exchange of GTS-type Na titanasilicate and its structural characterization

\*Keiko FUJIWARA<sup>1</sup>, Naomi Kawata<sup>1</sup>, Akihiko Nakatsuka<sup>1</sup>

1. Yamaguchi Univ. Sci. Tech. Innov.

GTS-type microporous titanosilicates have a three-dimensional tunnel-type structure. In this structure, four TiO<sub>6</sub> octahedra linked by edge-sharing form a Ti<sub>4</sub>O<sub>16</sub> cluster; the clusters are linked through SiO<sub>4</sub> tetrahedra to form a three-dimensional framework with an interconnected pore system involving cavities of 8-ring channels, occupied by the alkali-metal ions and adsorbed water molecules. It is reported that Na-GTS, Na<sub>4</sub>[(TiO)<sub>4</sub>(SiO<sub>4</sub>)<sub>3</sub>]·6H<sub>2</sub>O, crystallizes in a rhombohedral phase with space group *R3m*; its unit cell [*a* = 7.8123 (6) Å, *α* = 88.794 (9) °] is very close to cubic cell and often described as a pseudocubic cell. In this study, we focused on Mg<sup>2+</sup> and Ba<sup>2+</sup>, which have the different ionic size from and the same valence as the radioactive elements Sr<sup>2+</sup>. We investigated the effects of ionic size and valence on the Mg<sup>2+</sup>- and Ba<sup>2+</sup>-exchange properties of Na-GTS.

We have prepared the ion-exchanged forms, Na<sub>4(1-x)}</sub>M<sub>2x</sub>[(TiO)<sub>4</sub>(SiO<sub>4</sub>)<sub>3</sub>]·*y*H<sub>2</sub>O (M: Mg, Ba), by treating Na-GTS with MgCl<sub>2</sub> and BaCl<sub>2</sub> aqueous solutions (*C<sub>M</sub>* = 0 ~ 7.9 mol/L) at 25 °C for 24 hours. The maximum ion-exchange rates of Mg and Ba were *x* = 0.76 and 0.86, respectively. We evaluated the unit-cell parameters from the powder X-ray diffraction (XRD) by a profile fitting method assuming a rhombohedral unit-cell and the H<sub>2</sub>O content (*y*) by TG. The increase in the ion-exchange rate (*x*) decreases the unit-cell volumes (*V*) and the H<sub>2</sub>O contents (*y*) of the Ba<sup>2+</sup>-exchanged samples, but increases those of the Mg<sup>2+</sup>-exchanged samples. The increase in *V* of the Mg<sup>2+</sup>-exchanged samples can be due to the increase in the *y* value; it can be brought about by the increase in the free space in the pores due to the exchange of smaller divalent Mg<sup>2+</sup> with larger monovalent Na<sup>+</sup>. The decrease in *V* of Ba<sup>2+</sup>-exchanged samples can be explained by the interpretation that the decrease in the number of exchangeable-cations due to the exchange of divalent Ba<sup>2+</sup> with monovalent Na<sup>+</sup> yields the decrease in the number of water molecules coordinating to it. In these samples, the cation distribution of Mg<sup>2+</sup> and Ba<sup>2+</sup> in the cavities will be discussed from the comparison of the observed and simulated XRD patterns.

Keywords: Na-GTS, Ion-exchange, Powder XRD

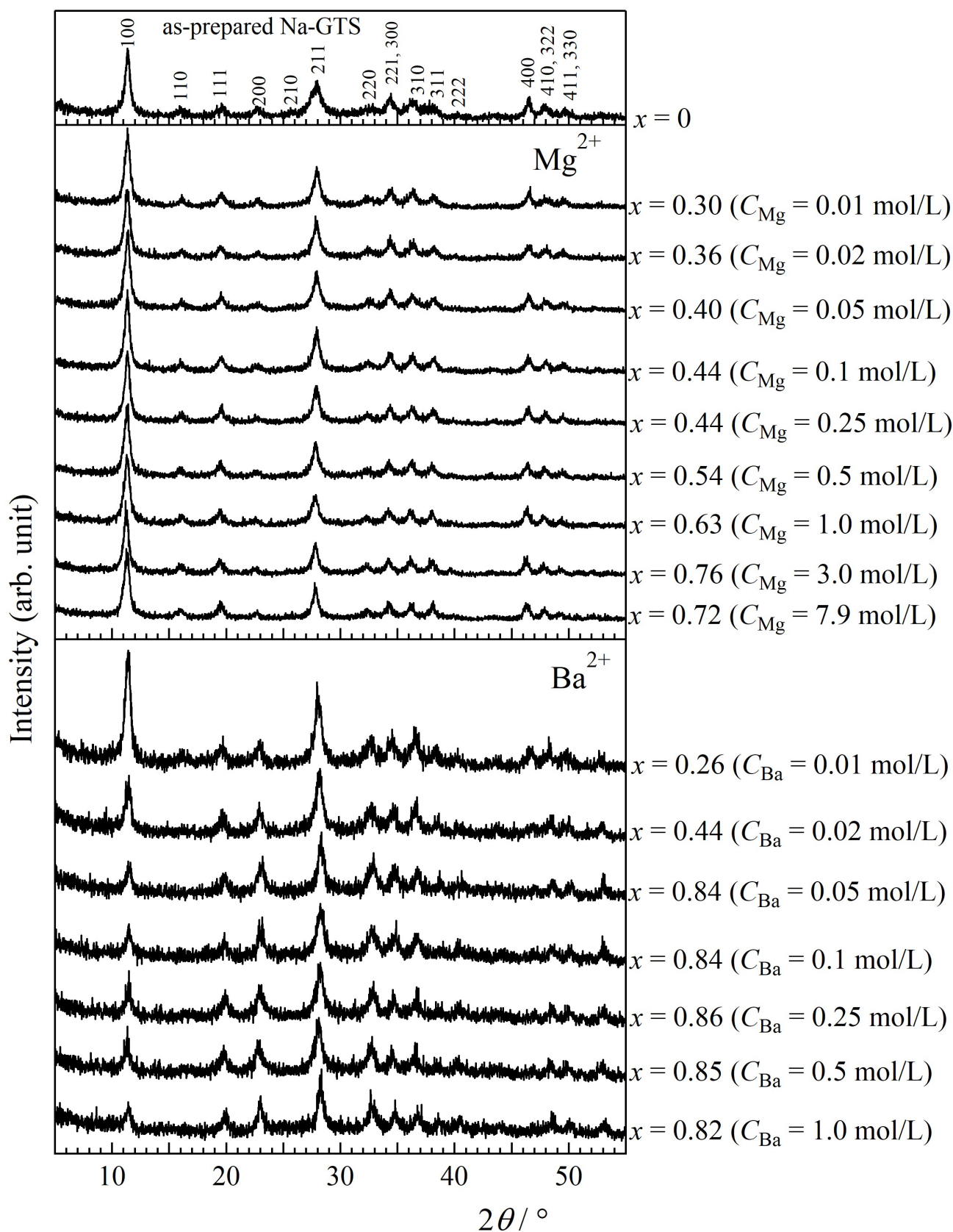


Fig. 1. Observed XRD patterns of  $Mg^{2+}$  and  $Ba^{2+}$ -exchanged Na-GTS.

## Distribution of Fe<sup>3+</sup> among tetrahedral sites and crystal structural change of gehlenite-Fe<sup>3+</sup> gehlenite

\*Maki HAMADA<sup>1</sup>, Mariko Nagashima<sup>2</sup>

1. Kanazawa University, 2. Yamaguchi University

Keywords: synthetic melilite, crystal structural change, gehlenite

## Crystallographic site preference of impurity elements in olivine by ALCHEMI method

\*Yohei IGAMI<sup>1</sup>, Akira MIYAKE<sup>1</sup>, Ryo WAKABAYASHI<sup>1</sup>, Norikatsu AKIZAWA<sup>2</sup>

1. Kyoto University, 2. The University of Tokyo

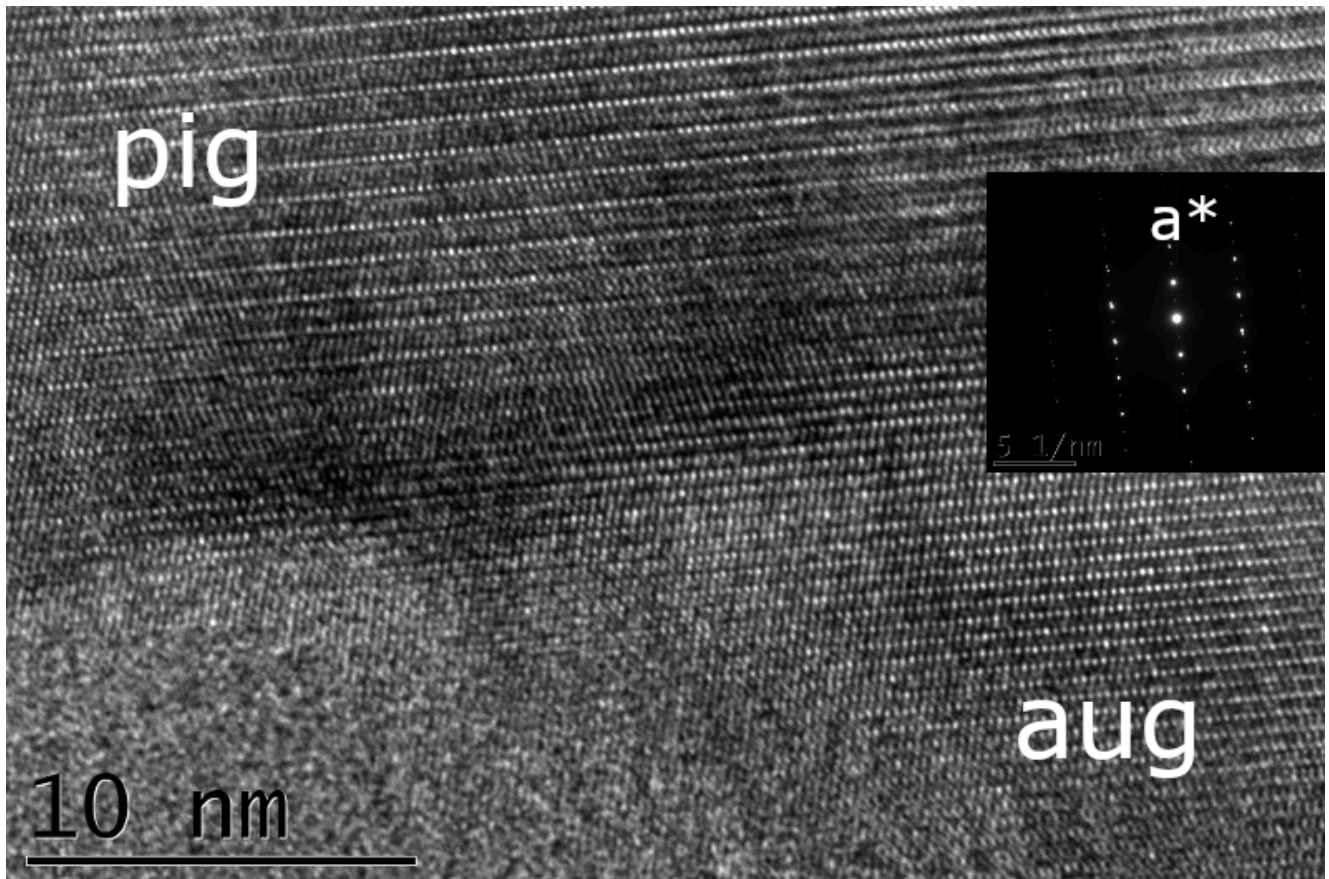
Keywords: olivine, cation site distribution, analytical electron microscopy, ALCHEMI

## Precipitated structures of pyroxene lamellar with various directions

\*Shoichi TOH<sup>1</sup>

1. Fukuoka University

Keywords: augite, pigeonite, exsolution, texture



## Crystal chemistry of bridgmanite with Al/Fe contents expected in MORB component

\*Akihiko NAKATSUKA<sup>1</sup>, Hiroshi FUKUI<sup>2</sup>, Seiji KAMADA<sup>3</sup>, Naohisa HIRAO<sup>2</sup>, Makio OHKAWA<sup>4</sup>, Kazumasa SUGIYAMA<sup>5</sup>, Takashi YOSHINO<sup>6</sup>

1. Yamaguchi Univ. Sci. Tech. Innov., 2. JASRI, 3. AD Science Inc., 4. Hiroshima Univ. Adv. Sci. Eng., 5. Tohoku Univ. IMR, 6. Okayama Univ. IPM

Bridgmanite (simplified formula  $\text{MgSiO}_3$ ) is the most abundant constituent in the Earth's lower mantle. The effects of the incorporation of Fe and Al into bridgmanite can have a large effect on the physical properties and rheology of the lower mantle. Bridgmanite formed from a mid-ocean ridge basalt (MORB) component of subducting slabs contains larger amounts of Fe and Al than that formed from a pyrolytic composition. This difference in bridgmanite composition can cause a difference in the incorporation mechanism of Fe and Al into the crystal structure between subducting slabs and their surrounding lower mantle. This should cause heterogeneity in the physical properties and rheology of the lower mantle. Elucidating the crystal chemistry of bridgmanite formed from the MORB composition is a key to resolving this issue. The precise crystal chemistry examined employing a single crystal is, therefore, significant for gaining a detailed understanding of lower-mantle dynamics. In particular, the use of  $^{57}\text{Fe}$ -Mössbauer spectroscopy is indispensable for distinguishing the valence and spin states of Fe, which cannot be directly observed by X-ray diffraction. For this purpose, we characterize  $\text{Mg}_{0.662}\text{Fe}_{0.338}\text{Si}_{0.662}\text{Al}_{0.338}\text{O}_3$  bridgmanite single-crystal, with the Fe and Al contents expected in MORB, by a combination of single-crystal X-ray diffraction, synchrotron  $^{57}\text{Fe}$ -Mössbauer spectroscopy conducted at SPring-8 BL10XU, and electron probe microanalysis.

The present study reveals that the charge-coupled substitution  $^{\text{A}}\text{Mg}^{2+} + ^{\text{B}}\text{Si}^{4+} \leftrightarrow ^{\text{A}}\text{Fe}^{3+}(\text{high-spin}) + ^{\text{B}}\text{Al}^{3+}$  is predominant in the incorporation of Fe and Al into the practically eightfold-coordinated A-site and the sixfold-coordinated B-site in bridgmanite structure. The incorporation of both cations via this substitution enhances the structural distortion due to the tilting of  $\text{BO}_6$  octahedra, yielding the unusual expansion of mean  $\langle\text{A-O}\rangle$  bond-length due to flexibility of A-O bonds for the structural distortion, in contrast to mean  $\langle\text{B-O}\rangle$  bond-length depending reasonably on the ionic radius effect. Moreover, we imply the phase transition behavior and the elasticity of bridgmanite in slabs subducting into deeper parts of the lower mantle, in terms of the relative compressibility of  $\text{AO}_{12}$  (practically  $\text{AO}_8$ ) and  $\text{BO}_6$  polyhedra.

Keywords: Bridgmanite, MORB, Single-crystal X-ray diffraction, Synchrotron Mössbauer

## Mechanism of the pressure-induced crystallization of amorphous calcium carbonate

\*Chiho Morita<sup>1</sup>, Hiroki Kobayashi<sup>1</sup>, Hiroyuki Kagi<sup>1</sup>

1. UTokyo. Sci.

Keywords: Amorphous calcium carbonate, Calcite, High pressure

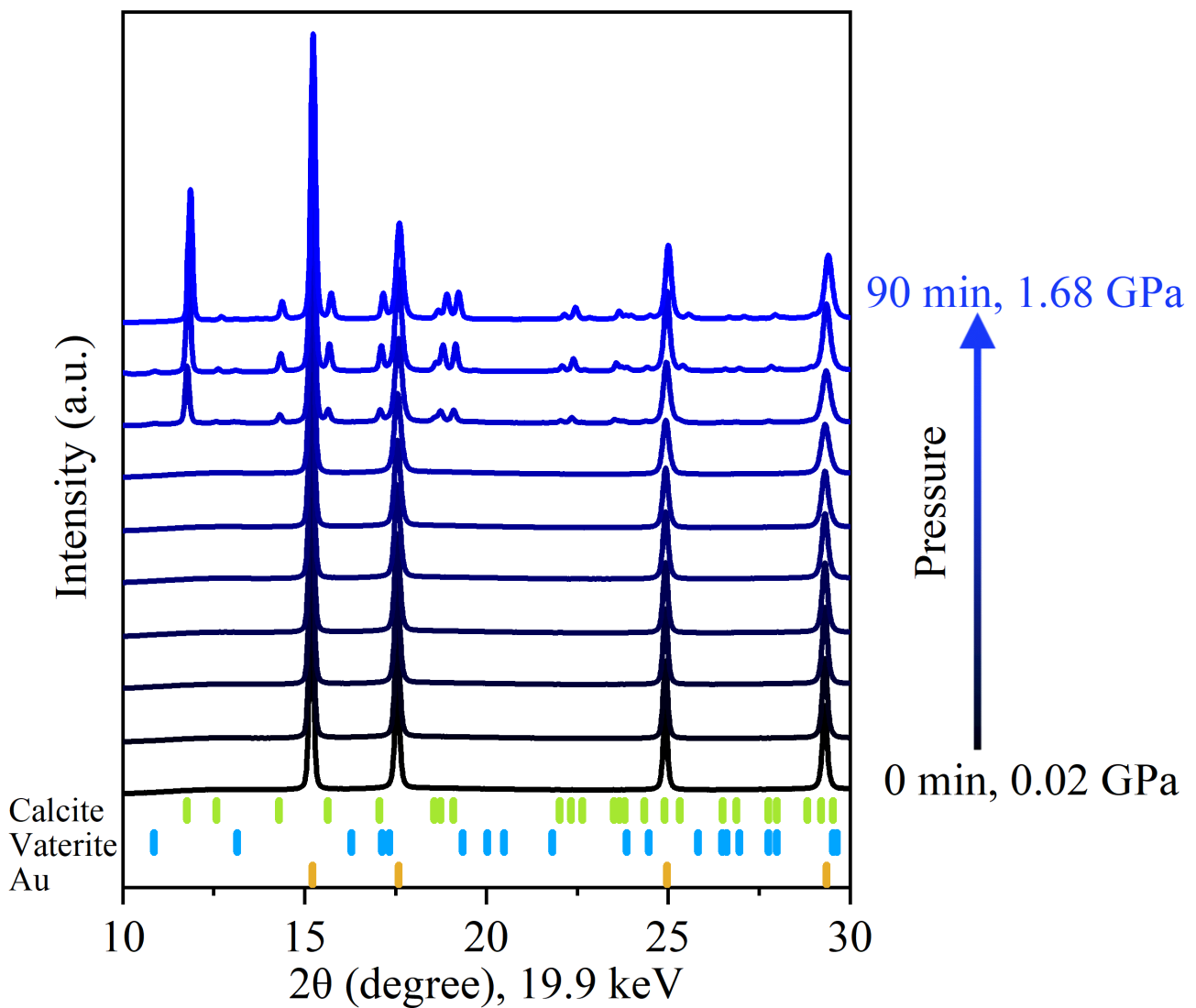


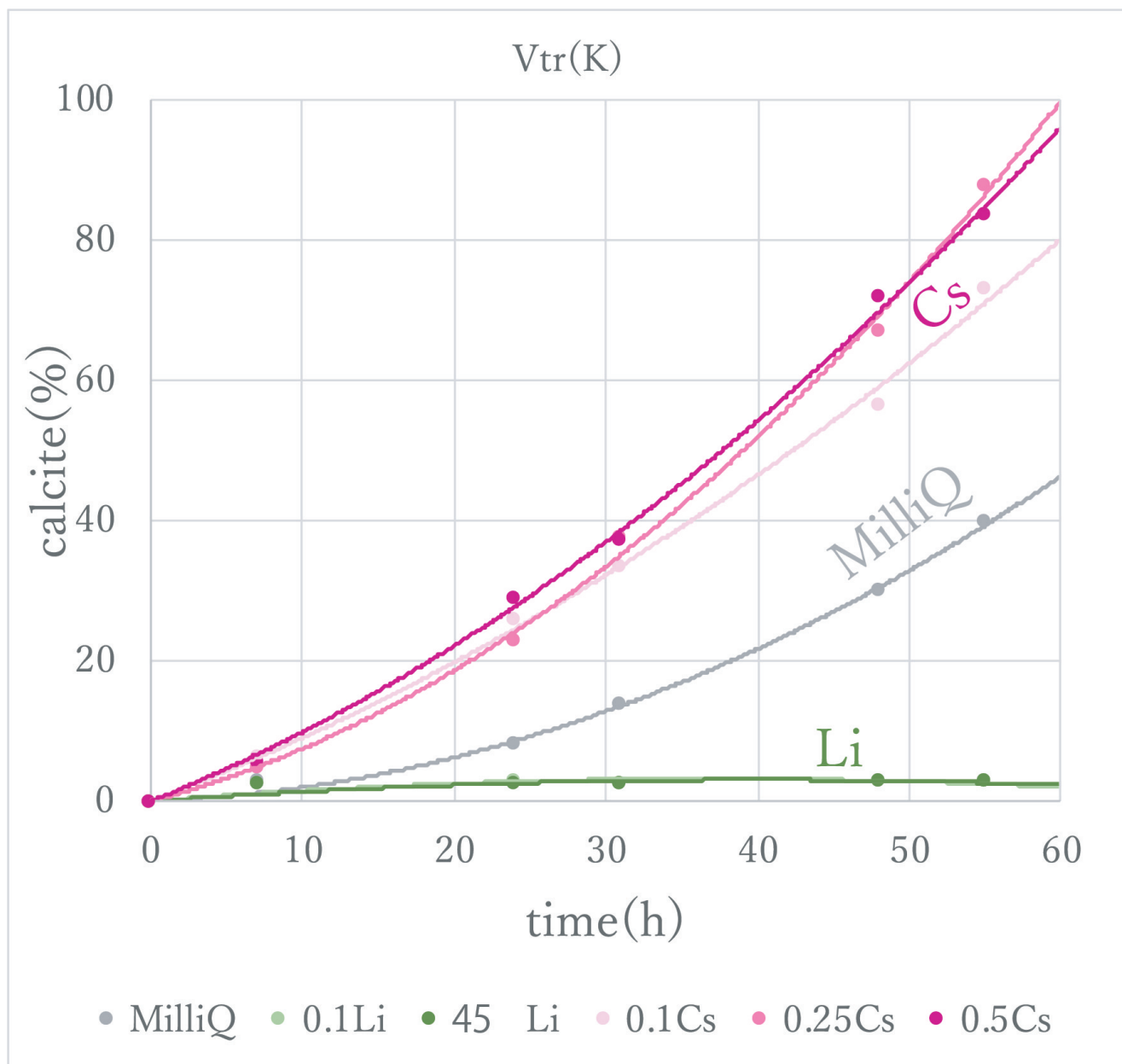
図. ACCの圧力誘起結晶化の時分割X線回折パターン

## Differences in the effects of Li and Cs on the calcitization of vaterite.

\*Noboru FURUKAWA<sup>1</sup>, Ami Kinoda<sup>2</sup>

1. Chiba University, 2. NIWAKA

Keywords: vaterite, calcitization, Lithium, Cesium



Poster presentation | R5: Extraterrestrial materials

📅 Sat. Sep 14, 2024 12:30 PM - 2:00 PM JST | Sat. Sep 14, 2024 3:30 AM - 5:00 AM UTC | 🏢 Entrance  
Hall Higashiyama Campus

**R5: Extraterrestrial materials**

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-01] Dehydration of Newberyite( $\text{MgHPO}_4 \cdot 3\text{H}_2\text{O}$ ) under low pressures

\*Yukako Matsumoto<sup>1</sup>, Shogo Tachibana<sup>1</sup> (1. UTokyo)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-02] Experimental simulation of oxygen isotope exchange between chondrule melt and low-pressure water vapor

\*Daiki YAMAMOTO<sup>1</sup>, Noriyuki Kawasaki<sup>2</sup> (1. Kyushu University, 2. Hokkaido University)

---

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-03] Early impact events recorded in anomalous eucrites

\*Akira YAMAGUCHI<sup>1</sup> (1. National Institute of Polar Research)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-04] Internal Structure Analysis of Carbonaceous Material in Yamato 8448 Ureilite

\*Masahiro YASUTAKE<sup>1</sup>, Megumi Matsumoto<sup>2</sup>, Akira Tsuchiyama<sup>3,4</sup>, Kentaro Uesugi<sup>1</sup>, Akihisa Takeuchi<sup>1</sup>, Akira Yamaguchi<sup>5</sup> (1. JASRI, 2. Tohoku Univ., 3. Ritsumeikan Univ., 4. CAS/GIG, 5. NIPR)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R5-P-05] Effects of initial porosity on shock deformation microstructures in rutile

\*Yuhei Umeda<sup>1,2</sup>, Yuma Nagai<sup>1,2</sup>, Naotaka Tomioka<sup>3</sup>, Toshimori Sekine<sup>4</sup>, Masashi Miyakawa<sup>5</sup>, Takamichi Kobayashi<sup>5</sup>, Hitoshi Yusa<sup>5</sup>, Takuo Okuchi<sup>1,2</sup> (1. KURNS, 2. Kyoto Univ. Eng., 3. JAMSTEC, 4. HPSTAR, 5. NIMS)

## Dehydration of Newberyite( $\text{MgHPO}_4 \cdot 3\text{H}_2\text{O}$ ) under low pressures

\*Yukako Matsumoto<sup>1</sup>, Shogo Tachibana<sup>1</sup>

1. UTokyo

Keywords: Bennu, phosphate, dehydration, asteroid, Newberyite

## Experimental simulation of oxygen isotope exchange between chondrule melt and low-pressure water vapor

\*Daiki YAMAMOTO<sup>1</sup>, Noriyuki Kawasaki<sup>2</sup>

1. Kyushu University, 2. Hokkaido University

Keywords: chondrule melt, low-pressure water vapor, oxygen isotope exchange, kinetics, protosolar disk

## Early impact events recorded in anomalous eucrites

\*Akira YAMAGUCHI<sup>1</sup>

1. National Institute of Polar Research

Keywords: meteorites, achondrites, thermal history, impact

## Internal Structure Analysis of Carbonaceous Material in Yamato 8448 Ureilite

\*Masahiro YASUTAKE<sup>1</sup>, Megumi Matsumoto<sup>2</sup>, Akira Tsuchiyama<sup>3,4</sup>, Kentaro Uesugi<sup>1</sup>, Akihisa Takeuchi<sup>1</sup>, Akira Yamaguchi<sup>5</sup>

1. JASRI, 2. Tohoku Univ., 3. Ritsumeikan Univ., 4. CAS/GIG, 5. NIPR

Keywords: Ureilite, Diamond, SR-XCT

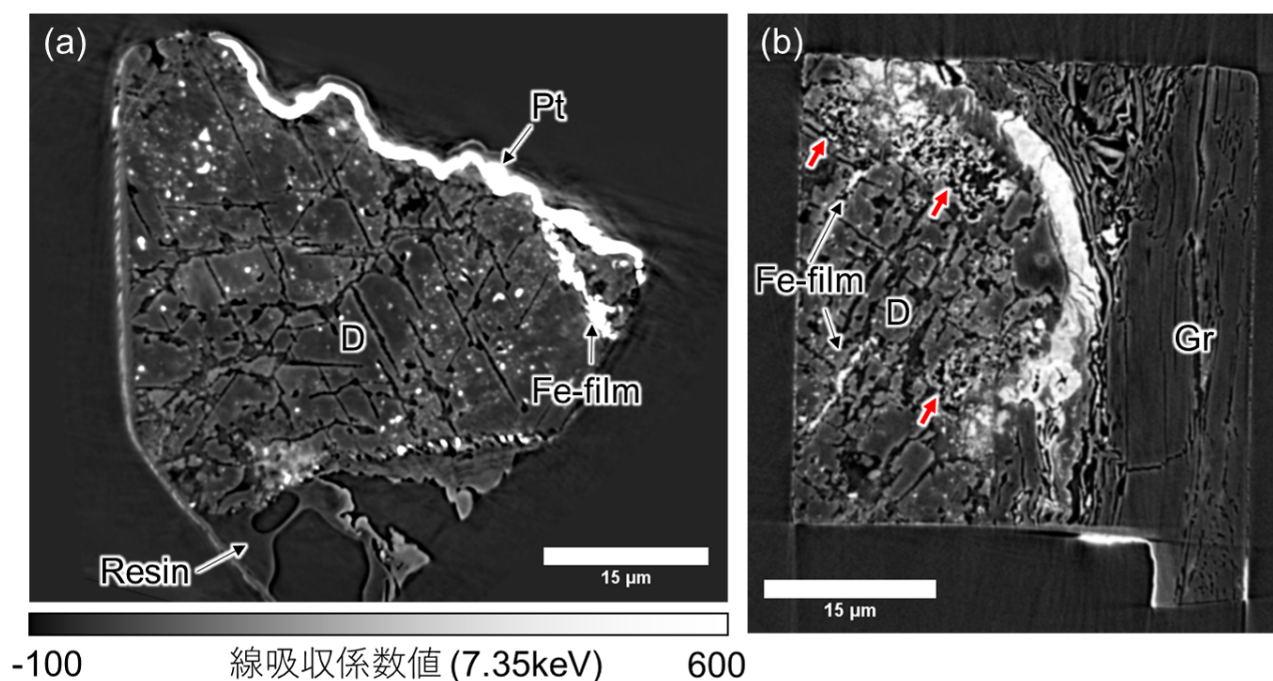


図1. 炭素質物質のCT断面像。X線エネルギーは7.35keV。左下に表示コントラストを示す。(a) 黒色部からサンプリングした試料の断面像。60度120度で交わる線構造が確認できる。図中白い粒は鉄に富む包有物である。図中右端にはダイヤモンドを区切る鉄に富む膜が分布している。(b) 境界部からサンプリングした試料の断面像。図中右側にグラファイトから成る茶色部が、左側にダイヤモンドを主体とする黒色部が分布する。図中中央に分布する白色部は鉄に富む層である。茶色部は黒色部と比較し鉄に富む物質に乏しい事が分かる。赤矢印は虫食い状になったダイヤモンドを示す。図中略語：D:ダイヤモンド、Gr:グラファイト、Pt:プラチナ保護膜、Fe-film:鉄に富む膜、Resin:樹脂。

## Effects of initial porosity on shock deformation microstructures in rutile

\*Yuhei Umeda<sup>1,2</sup>, Yuma Nagai<sup>1,2</sup>, Naotaka Tomioka<sup>3</sup>, Toshimori Sekine<sup>4</sup>, Masashi Miyakawa<sup>5</sup>, Takamichi Kobayashi<sup>5</sup>, Hitoshi Yusa<sup>5</sup>, Takuo Okuchi<sup>1,2</sup>

1. KURNS, 2. Kyoto Univ. Eng., 3. JAMSTEC, 4. HPSTAR, 5. NIMS

Keywords: Rutile, Shock deformation microstructures, Porosity

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

📅 Sat. Sep 14, 2024 12:30 PM - 2:00 PM JST | Sat. Sep 14, 2024 3:30 AM - 5:00 AM UTC | 🏢 Entrance  
Hall Higashiyama Campus

**R6: Plutonic rocks, volcanic rocks and subduction factory**

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-01] Orthopyroxene cumulates from a serpentinite mud-volcano in the mariana forearc: constituent rocks of the forearc Moho transition zone

\*Pia Ataka<sup>1</sup>, Yuji Ichiyama<sup>1</sup>, Shun Takamizawa<sup>1</sup>, Akihiro Tamura<sup>2</sup>, Tomoaki Motishita<sup>2</sup> (1. Chiba University, 2. Kanazawa University)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-02] Formation processes of high-Mg andesite associated with ophiolitic rocks in the Setogawa belt

\*Tsumugi Kato<sup>1</sup>, Yuji Ichiyama<sup>1</sup>, Akihiro Tamura<sup>2</sup>, Tomoaki Morishita<sup>2</sup> (1. Chiba Univ., 2. Kanazawa Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-03] Petrological and geochemical study of volcanics from Kuju volcanic group, Kyushu Island, Southwest Japan Arc.

「発表賞エントリー」

\*Soma Yamanaka<sup>1</sup>, Tomoyuki Shibata<sup>1</sup>, Ryotaro Fujihara<sup>1</sup>, Masako Yoshikawa<sup>1</sup>, Tomo Shibata<sup>2</sup> (1. Hiroshima Univ. Sci. & Tech, 2. Fukuoka Univ. Sci.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-04] Petrological study of intrusive rocks and their crustal xenoliths in the Suzu area, Atsumi district, Yamagata

\*Kazuhiro Tojo<sup>1</sup>, Takashi Hoshide<sup>1</sup> (1. Akita Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-05] Crystallization conditions of zircon and its crystallization relationship with surrounding minerals in the Tono plutonic complex, Kitakami mountains

\*Yasuhiro OGITA<sup>1,2</sup>, Shuhei Sakata<sup>3</sup>, Takeshi Ohno<sup>4</sup>, Tatsunori Yokoyama<sup>2</sup>, Satoshi Suzuki<sup>1</sup>, Kyoka Endo<sup>1</sup>, Takashi Yuguchi<sup>5</sup> (1. Yamagata Univ., 2. JAEA, Tono Geoscience Center, 3. The Univ. Tokyo, Earthquake Research Inst., 4. Gakushuin Univ., 5. Kumamoto Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-06] Petrography and magmatic processes of a diorite body distributed in the Kawakami region, Yamaguchi Prefecture, Japan

「発表賞エントリー」

\*Ryosei Sugiura<sup>1</sup>, Keisuke Eshima<sup>1</sup> (1. Yamaguchi University)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-07] Sr–Nd–Hf isotopic systematics for the Habu granodiorite, eastern part of Yamaguchi Prefecture

\*Masaaki OWADA<sup>1</sup>, Yusaku Akimoto<sup>2</sup>, Mariko Nagashima<sup>1</sup>, Keisuke Eshima<sup>1</sup>, Atsushi Kamei<sup>3</sup>, Nobuhiko Nakano<sup>4</sup>, Kenta Kawaguchi<sup>5</sup>, Yasuhito Osanai<sup>4</sup> (1. Yamaguchi Univ., 2. YON-C, 3. Shimane Uni., 4. Kyushu Univ., 5. Hiroshima Univ.)

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-08] Rare earth element compositions and U–Pb zircon age of granodiorite porphyrites in the Noko Island, western part of northern Kyushu

\*Masaki YUHARA<sup>1</sup>, Yoshinobu KAWANO<sup>2</sup>, Kazuhiro TSUKADA<sup>3</sup>, Purevdulam SUKHBAATAR<sup>4</sup> (1. Fukuoka Univ. Sci., 2. Rissyo Univ. Env. Sci., 3. Nagoya Univ. Mus., 4. Nagoya Univ. Env. St.)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-09] Compositional changes and growth processes of the Asakura granodiorite, Northern Kyushu, Japan.

「発表賞エントリー」

\*Yudai HAMANO<sup>1</sup>, Keisuke ESHIMA<sup>1</sup> (1. Yamaguchi Uni. Sci)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-10] Intrusive relationship and lithofacies classification of Granite–Granodiorite in Eastern Fukuoka Prefecture

「発表賞エントリー」

\*Ryo Nakamura<sup>1</sup>, Keisuke Eshima<sup>1</sup> (1. Yamaguchi University)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-11] Crystallization processes of quartz in a granitic magma: Implications for the magma chamber processes of Okueyama granite, Kyushu, Japan

\*Takashi YUGUCHI<sup>1</sup>, Takenori Kato<sup>4</sup>, Yasuhiro Ogita<sup>2</sup>, Minori Watanabe<sup>6</sup>, Asuka Kato<sup>6</sup>, Daichi Itoh<sup>6</sup>, Tatsunori Yokoyama<sup>2</sup>, Shuhei Sakata<sup>3</sup>, Takeshi Ohno<sup>5</sup> (1. Kumamoto University, 2. JAEA, 3. Uni. Tokyo ERI, 4. Nagoya University, 5. Gakushuin University, 6. Yamagata University)

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12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

[R6-P-13] Differentiation Processes of Granitic Magma Chamber Recorded in 'Oshima-ishi' Distributed in Oshima, Geiyo islands, Ehime Prefecture

\*Kazuya SHIMOOKA<sup>1,2</sup>, Soichiro AONO<sup>2</sup>, Takahito ONISHI<sup>2</sup>, Toko FUKUI<sup>2</sup>, Motohiro TSUBOI<sup>1</sup>, Toshiro TAKAHASHI<sup>3</sup>, Satoshi SAITO<sup>2</sup> (1. Kwansei Gakuin Univ., 2. Ehime Univ., 3. Niigata Univ.)

## Orthopyroxene cumulates from a serpentinite mud-volcano in the Mariana forearc: constituent rocks of the forearc Moho transition zone

\*Pia Ataka<sup>1</sup>, Yuji Ichiyama<sup>1</sup>, Shun Takamizawa<sup>1</sup>, Akihiro Tamura<sup>2</sup>, Tomoaki Motishita<sup>2</sup>

1. Chiba University, 2. Kanazawa University

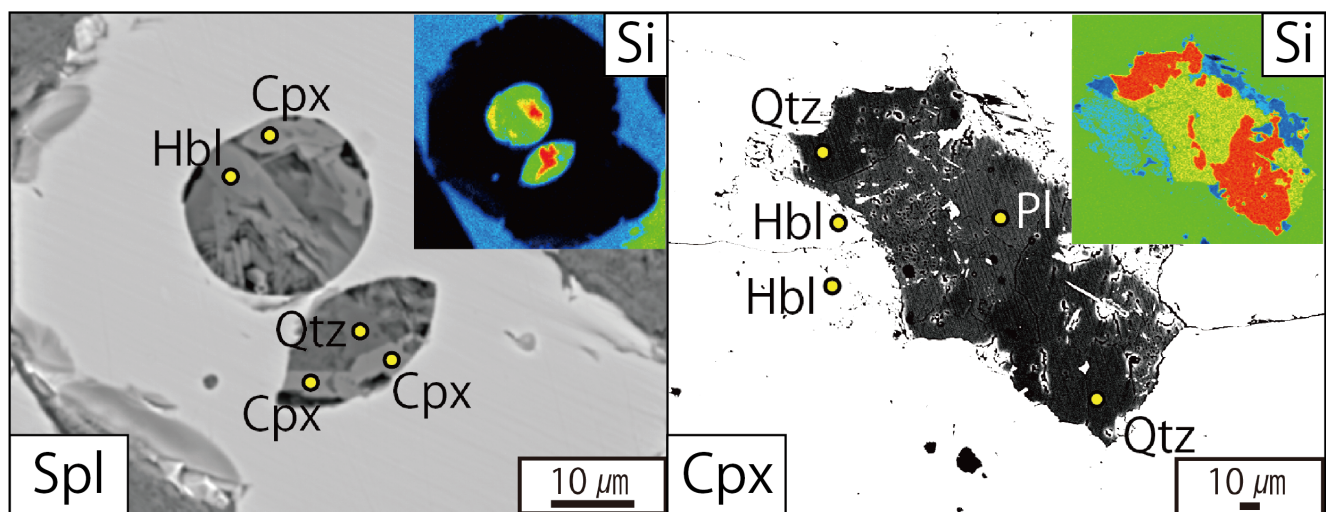
Keywords: Serpentine, Ophiolite, Mariana Forearc, Moho transition zone, cumulate

## Formation processes of high-Mg andesite associated with ophiolitic rocks in the Setogawa belt

\*Tsumugi Kato<sup>1</sup>, Yuji Ichiyama<sup>1</sup>, Akihiro Tamura<sup>2</sup>, Tomoaki Morishita<sup>2</sup>

1. Chiba Univ., 2. Kanazawa Univ.

Keywords: high-Mg andesite, Setogawa belt, felsic crystalline inclusions, magma mixing



## Petrological and geochemical study of volcanics from Kuju volcanic group, Kyushu Island, Southwest Japan Arc.

\*Soma Yamanaka<sup>1</sup>, Tomoyuki Shibata<sup>1</sup>, Ryotaro Fujihara<sup>1</sup>, Masako Yoshikawa<sup>1</sup>, Tomo Shibata<sup>2</sup>

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

Keywords: modal composition, Kuju, arc magma

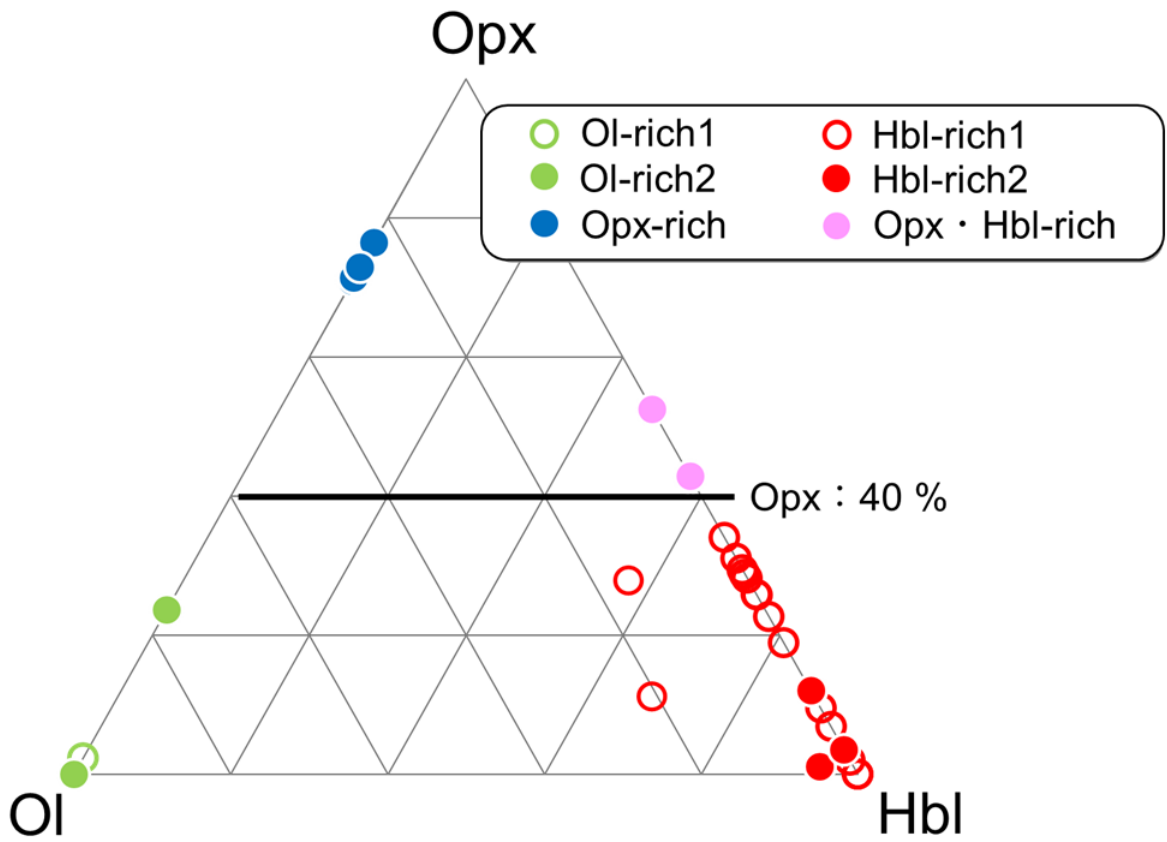


図 九重火山群火山岩類のモード組成。

## Petrological study of intrusive rocks and their crustal xenoliths in the Suzu area, Atsumi district, Yamagata

\*Kazuhiro Tojo<sup>1</sup>, Takashi Hoshide<sup>1</sup>

1. Akita Univ.

Keywords: Petrology, Xenoliths

## Crystallization conditions of zircon and its crystallization relationship with surrounding minerals in the Tono plutonic complex, Kitakami mountains

\*Yasuhiro OGITA<sup>1,2</sup>, Shuhei Sakata<sup>3</sup>, Takeshi Ohno<sup>4</sup>, Tatsunori Yokoyama<sup>2</sup>, Satoshi Suzuki<sup>1</sup>, Kyoka Endo<sup>1</sup>, Takashi Yuguchi<sup>5</sup>

1. Yamagata Univ., 2. JAEA, Tono Geoscience Center, 3. The Univ. Tokyo, Earthquake Research Inst., 4. Gakushuin Univ., 5. Kumamoto Univ.

No abstract in English.

Keywords: Zircon, U-Pb age, Ti concentration, Tono Plutonic Complex

表1 遠野岩体のジルコンの産状と分析数

岩相	サンプル名	分析点数	ジルコン粒子数				
			in Qtz	in Bt	in Afs	粒間	
中心相	025	23	4	1	1	0	2
	029	3	1	1	0	0	0
	102	11	4	1	0	1	2
主岩相	021	5	4	1	1	0	2
	404	6	3	0	0	0	3
	405	31	11	0	3	0	8

in Qtz: 石英に包有されるジルコン, in Bt: 黒雲母に包有されるジルコン,  
in Afs: アルカリ長石に包有されるジルコン, 粒間: 粒間に産出するジルコン

# Petrography and magmatic processes of a diorite body distributed in the Kawakami region, Yamaguchi Prefecture, Japan

\*Ryosei Sugiura<sup>1</sup>, Keisuke Eshima<sup>1</sup>

1. Yamaguchi University

Keywords: Grandiorite, Volcanic-plutonic complex, Kwanmon Group, Shunan Group

## Sr–Nd–Hf isotopic systematics for the Habu granodiorite, eastern part of Yamaguchi Prefecture

\*Masaaki OWADA<sup>1</sup>, Yusaku Akimoto<sup>2</sup>, Mariko Nagashima<sup>1</sup>, Keisuke Eshima<sup>1</sup>, Atsushi Kamei<sup>3</sup>, Nobuhiko Nakano<sup>4</sup>, Kenta Kawaguchi<sup>5</sup>, Yasuhito Osanai<sup>4</sup>

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We performed geological, petrographical, and geochemical investigations including Sr–Nd–Hf isotopic studies for the Habu granodiorite located in the eastern part of Yamaguchi Prefecture, and discussed its magmatic processes and source materials. The laccolithic Habu granodiorite consists mainly of the leucocratic biotite granodiorite (leucocratic facies) surrounded by the thin-skinned hornblende-biotite granodiorite (melanocratic facies). Zircon U–Pb dating gives ages of c. 105 Ma for both lithofacies. Although the whole-rock chemical data of both lithofacies make monotonous trends on some binary plots, the leucocratic facies are slightly affected by crustal contaminations, as evidenced by Sr–Nd isotopic features. Epsilon Hf isotopic model ages revealed that the Habu granodiorite would be derived from the mafic lower crust probably separated from the depleted mantle during the Mesoproterozoic time.

Keywords: Habu granodiorite, Magmatic processes, Source materials, Multi-isotopic systematics, Igneous activities Southwest Japan

## Rare earth element compositions and U-Pb zircon age of granodiorite porphyrites in the Noko Island, western part of northern Kyushu

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Keywords: granodiorite porphyrite, Noko Island, Sr and Nd isotopic composition, Rare earth element compositions, U-Pb zircon age

## Compositional changes and growth processes of the Asakura granodiorite, Northern Kyushu, Japan.

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Keywords: Cretaceous, Northern Kyushu batholith, Granodiorite, Lithofacies change, Growth processes

# Intrusive relationship and lithofacies classification of Granite–Granodiorite in Eastern Fukuoka Prefecture

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Keywords: plutonic rock, Cretaceous , plutonic complex, intrusive relationship, magma mixing

## Crystallization processes of quartz in a granitic magma: Implications for the magma chamber processes of Okueyama granite, Kyushu, Japan

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Keywords: Quartz, Cathodoluminescence, TitaniQ thermometer, Okueyama granite, Ti-in-zircon thermometer

## Differentiation Processes of Granitic Magma Chamber Recorded in 'Oshima-ishi' Distributed in Oshima, Geiyo islands, Ehime Prefecture

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Keywords: Oshima-ishi, Cretaceous granitoids, Differentiation Processes, Mafic magma, Oshima, Geiyo islands