

Sat. Sep 14, 2024

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

9:00 AM - 12:00 PM JST | 12:00 AM - 3:00 AM UTC | ES Hall Higashiyama Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson: Tatsuhiko Kawamoto (Shizuoka University), Takashi Yuguchi, Atsushi Kamei

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

[R6-01] Compositional evolution of slab-derived fluids during ascent and origin of subduction-zone primary magmas: Implications from trace-element partition between hydrous melts and Cl-free or Cl-rich aqueous fluids

*Hajime TANIUCHI¹, Tatsuhiko KAWAMOTO², Takayuki NAKATANI¹, Osamu ISHIZUKA¹, Toshihiro SUZUKI¹, Akihiko Tomiya¹ (1. GSJ, AIST, 2. Shizuoka Univ.)

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

[R6-02] New crust and mantle physical properties research from the development of rock synthesis methods

「招待講演」

*Sanae Koizumi¹ (1. The University of Tokyo)

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

[R6-03] The use of contact metamorphism to identify plutons associated with major contemporaneous eruption and estimate magma flux

*Simon R WALLIS¹, Ken Yamaoka², Akira Miyake³, Catherine Annen⁴ (1. The University of Tokyo, 2. AIST, 3. Aichi University of Education, 4. Institute of Geophysics, Czech Academy of Sciences)

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

[R6-04] Petrography and geochronology of the Kuki granite, Kitakami Mountains, northeastern Japan: Shallow crustal intrusion and emplacement processes of granitic magma

*Satoshi SUZUKI¹, Takashi YUGUCHI², Keito ISHIGURO¹, Kyoka ENDO¹, Asuka KATO¹, Kosuke YOKOYAMA¹, Yasuhiro OGITA³, Tatsunori YOKOYAMA³, Shuhei SAKATA⁴, Takeshi OHNO⁵, Eiji SASAO³ (1. Yamagata University, 2. Kumamoto University, 3. Japan Atomic Energy Agency, 4. University of Tokyo, 5. Gakushuin University)

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

[R6-05] Zircon U-Pb dating of granitoids in the Hobenzan area, western Yamaguchi Prefecture, southwest Japan

*Yukiyasu TSUTSUMI¹, Kenichiro TANI¹ (1. National Museum of Nature and Science)

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

[R6-06] Estimation of temperature and pressure conditions of granitoids in the eastern part of Shimane Prefecture, San'in Belt.

*Kai Nakahashi¹, Satoshi SAITO¹ (1. Ehime University Graduate School of Science and Engineering, Earth Science Division)

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

[R6-07] Primary magma of Cretaceous Northern Kyushu batholith: New approach from Cumulus rocks

*Keisuke ESHIMA¹, Masaaki OWADA¹, Atsushi KAMEI² (1. Yamaguchi Univ. Sci., 2. Shimane Univ.)

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

[R6-08] Origin of the Cretaceous ignimbrite flare-up in SW Japan

*Ken Yamaoka¹, Tokiyuki Morohoshi², Daisuke Sato¹, Kazuto Mikuni¹ (1. AIST, 2. Univ. Tokyo. Sci.)

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

[3Lecture-101-11-9add] 休憩

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

[R6-09] The genesis of garnet in the Quaternary rhyolite of Hime-shima volcanic group, EEast Kyushu, Southwest Japan Arc.

*Takehiro HIRAYAMA^{1,2}, Tomoyuki SHIBATA², Masako YOSHIKAWA² (1. Tokyo University, 2. Hiroshima University)

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

[R6-10] K–Ar ages and geochemical compositions of Early Pleistocene andesites from southern Kyushu, Japan

*Raiki YAMADA¹, Masakazu Niwa¹, Koji Umeda², Koshi Yagi³, Taisei Fujiwara³, Ikuo Okada³, Fukuka Kida¹ (1. Japan Atomic Energy Agency, 2. Hirosaki University, 3. Hiruzen Institute for Geology and Geochronology)

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

[R6-11] Thermal history of pluton formation from Sr diffusion in plagioclase: implications for magma flux estimation and identification of plutons associated with major eruptions

「発表賞エントリー」

*Tokiyuki Morohoshi¹, Simon Richard Wallis¹ (1. The University of Tokyo)

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

9:00 AM - 12:00 PM JST | 12:00 AM - 3:00 AM UTC | ES024 Higashiyama Campus

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

Chairperson: Fumiya Noritake, Mariko Nagashima, Makoto Tokuda

9:00 AM - 9:20 AM JST | 12:00 AM - 12:20 AM UTC

[R2-01] Changes of physical and structural properties of hydrous minerals induced by dehydration of coordinated water molecules

「招待講演」

*Ryo YAMANE¹ (1. Tohoku University)

9:20 AM - 9:35 AM JST | 12:20 AM - 12:35 AM UTC

[R2-02] Phase change of priceite $\text{Ca}_2\text{B}_5\text{O}_7(\text{OH})_5 \cdot \text{H}_2\text{O}$ during thermal decomposition

*Atsushi KYONO¹, Kosuke Yamaguchi¹, Satoru Okada¹, Hiroki Hasegawa¹ (1. Life & Environmental Sciences, University of Tsukuba)

9:35 AM - 9:50 AM JST | 12:35 AM - 12:50 AM UTC

[R2-03] The incorporation mechanisms of water in aluminous orthoenstatite clarified via comprehensive NMR measurements and first-principles calculations

*Xianyu XUE¹, Masami Kanzaki¹, Rongzhang Yin² (1. Okayama University, 2. Peking University)

9:50 AM - 10:05 AM JST | 12:50 AM - 1:05 AM UTC

[R2-04] Evaluation of the influence of polishing condition on hydrogen diffusion in fluorapatite and estimation of the diffusion mechanism

「発表賞エントリー」

*Chikashi Yoshimoto¹, Isao Sakaguchi², Shoichi Itoh¹ (1. Kyoto University, 2. NIMS)

10:05 AM - 10:20 AM JST | 1:05 AM - 1:20 AM UTC

[R2-05] Evaporation kinetics of forsterite in low-pressure H_2 - H_2O atmosphere

「発表賞エントリー」

*Shiori Inada¹, Shogo Tachibana¹ (1. The University of Tokyo)

10:20 AM - 10:30 AM JST | 1:20 AM - 1:30 AM UTC

[3Lecture-201-11-6add] 休憩

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

[R2-06] Origine of framboidal goethite in sandstone in the Saiki Subgroup of the Lower Shimanto Group

*Hiroaki OHFUJI¹, Seira Konishi¹, Hiroshi Yamamoto² (1. Tohoku Univ. Sci, 2. Kagoshima Univ. Sci)

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

[R2-07] Precursor phenomenon of ultrananolite crystallization: liquid immiscibility in the volcanic glass

*Mayumi Mujin¹, Keiko Matsumoto², Akira Miyake³, Yohei Igami³, Michihiko Nakamura¹, Akihiko Yokoo³, Mitsuhiro Yoshimoto⁴ (1. Tohoku University, 2. National Institute of Advanced Industrial Science and Technology (AIST), 3. Kyoto University, 4. Mount Fuji Research Institute, Yamanashi Prefectural Government)

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

[R2-08] Calorimetric constraint of cation disordering enthalpy in MgAl_2O_4 spinel

*Hiroshi KOJITANI¹, Ryuji Matsuki¹, Yuta Nishimura¹, Itaru Ohira¹ (1. Gakushuin University)

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

[R2-09] Solid solubilities of Na^+ and K^+ in perovskite type SrTiO_3

Ryogo KITAI², *Takaya NAGAI¹, Jun KAWANO¹, Ayako Shinozaki¹ (1. Hokkaido Univ. Faculty Sci., 2. Hokkaido Univ. School Sci.)

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

[R2-10] Study on the consistency of Li conductivity measurements of (Li,La)TiO₃ with perovskite structure and Li migration during SIMS measurements

*Isao SAKAGUCHI¹, Tsuyoshi Onishi¹ (1. National Institute for Materials Science)

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

[R2-11] Structure transition mechanism under high pressure of Fe-Ti-O system phases

*Takamitsu YAMANAKA^{1,2}, Takanori Hattori³, Ho-kwang Mao¹ (1. Center for High Pressure Science and Technology Advanced Research, 2. Graduate School of Science Osaka University, 3. J-PARC)

Oral presentation | R5: Extraterrestrial materials

9:00 AM - 12:00 PM JST | 12:00 AM - 3:00 AM UTC | ES025 Higashiyama Campus

R5: Extraterrestrial materials

Chairperson: Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Toru Matsumoto (Kyoto University)

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

[R5-01] Revealing Chemical Compositional Variety of Amorphous Silicate Dust around AGB Stars by Condensation Experiment and Spectroscopic Analysis

「発表賞エントリー」

*Hanako Enomoto¹, Aki Takigawa¹, Hiroki Chihara², Chiyoeko Koike² (1. UTokyo, 2. Osaka Sangyo univ.)

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

[R5-02] Formation process of circumstellar dust studied from presolar oxides in carbonaceous chondrite DOM 08006.

「発表賞エントリー」

*Hiroyuki Hashizume¹, Aki Takigawa¹ (1. UTokyo EPSS)

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

[R5-03] Progress of irreversible chemical reactions on dust moving in a protoplanetary disk

*Lily Ishizaki¹, Shogo Tachibana¹ (1. UT EPS)

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

[R5-04] Experimental study of the effect of evaporation during temperature rise on type B CAI formation

「発表賞エントリー」

*Yasuaki Tsuruoka¹, Shogo Tachibana¹ (1. UTokyo Sci.)

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

[R5-05] Chondrule formation by collisions of planetesimals containing volatiles

「招待講演」

*Sin-iti Sirono¹ (1. Navoya Univ.)

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

[3Lecture-301-10-6add] 休憩

10:35 AM - 10:55 AM JST | 1:35 AM - 1:55 AM UTC

[R5-06] Constraining the true timescale of chondrule formation through chondrule mineral chemistry

「招待講演」

*Kohei Fukuda¹, Noriko T Kita², Makoto Kimura³ (1. Osaka Univ. Sci., 2. UW-Madison, 3. NIPR)

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

[R5-07] Reproduction Experiments of Radial Pyroxene Chondrules Using a Gas-jet Levitation System under Reducing Conditions

「発表賞エントリー」

*Kana Watanabe¹, Tomoki Nakamura¹, Tomoyo Morita¹ (1. Tohoku Univ. Sci.)

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

[R5-08] Stratigraphy of poikilitic shergottite parent body(ies) as deduced from their textural and mineral compositional diversities

「発表賞エントリー」

*Sojiro Yamazaki¹, Akira Yamaguchi², Takashi Mikouchi³ (1. Fac. Sci., Univ. Tokyo, 2. Natl. Inst. Polar Res., 3. Univ. Museum, Univ. Tokyo)

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

[R5-09] High pressure phase transition of Ti-Cr-rich spinel in Asuka 12325 Martian meteorite

*Atsushi TAKENOUCHI¹, Yohei Igami², Takashi Mikouchi³, Akira Miyake², Akira Yamaguchi⁴ (1. The Kyoto Univ. Museum, 2. Kyoto Univ. Sci., 3. The Univ. Museum, The Univ. of Tokyo, 4. NIPR)

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

[R5-10] Estimation of thermal history using silica minerals in mesosiderites

*Haruka OONO¹, Atsushi Takenouchi², Takashi Mikouchi³, Akira Yamaguchi⁴, Naoji Sugiura⁵, Akira Miyake¹ (1. Kyoto Univ., 2. Museum of Kyoto Univ., 3. Museum of Univ. Tokyo, 4. NiPR, 5. Chiba Int. Tech.)

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

2:00 PM - 3:00 PM JST | 5:00 AM - 6:00 AM UTC | ES Hall Higashiyama Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson: Takashi Hoshide (Akita University)

2:00 PM - 2:20 PM JST | 5:00 AM - 5:20 AM UTC

[R6-12] Zirconium minerals in ultramafic rocks

「招待講演」

*Hikaru Sawada^{1,2}, Ryosuke Oyanagi^{3,2} (1. University of Toyama, 2. JAMSTEC, 3. Kokushikan University)

2:20 PM - 2:35 PM JST | 5:20 AM - 5:35 AM UTC

[R6-13] Estimation of physical conditions during granitic magma crystallization process using melt inclusions in zircon

*Yuka TANIWAKI¹, Satoshi SAITO² (1. Ciatec., Co LTD, 2. Ehime Univ.)

2:35 PM - 2:50 PM JST | 5:35 AM - 5:50 AM UTC

[R6-14] Estimation of TiO₂ activity for accurate determination of quartz crystallization temperature

*Yasuhiro OGITA¹, Takenori Kato², Takashi Yuguchi³ (1. Yamagata Univ., 2. Nagoya Univ., 3. Kumamoto Univ.)

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

2:00 PM - 3:30 PM JST | 5:00 AM - 6:30 AM UTC | ES024 Higashiyama Campus

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

Chairperson: Kazuki 小松 Komatsu

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

[R2-12] Structural stabilization of pyrite-type compounds and chemical bonds of anions.

「招待講演」

*Akira YOSHIIASA¹, Makoto Tokuda¹, Ginga Kitahara¹, Akihiko Nakatsuka², Kazumasa Sugiyama³ (1. Kumamoto University, 2. Yomaguchi University, 3. Tohoku University)

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

[R2-13] Formation of Fundamental Building Blocks Composed of Calcium Borate Minerals

「発表賞エントリー」

*Kosuke Yamaguchi¹, Atsushi Kyono², Satoru Okada¹, Hiroki Hasegawa¹ (1. Univ of Tsukuba. Grad. Sch. of Life and Env., Sci, 2. Univ of Tsukuba. Life and Environmental Science)

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

[R2-14] Crystal structures of kimuraite-(Y) and lokkaite-(Y)

*Ritsuro Miyawaki¹, Koichi Momma¹ (1. National Museum of Nature and Science)

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

[R2-15] Thermal Vibration of Oxygen atoms in Keatite Crystal

*Fumiya NORITAKE¹ (1. University of Yamanashi)

3:15 PM - 3:30 PM JST | 6:15 AM - 6:30 AM UTC

[R2-16] Development of a simulation method for electron back-scattered diffraction based on dynamical theory and its application to mineralogy

*Yusuke SETO¹, Masahiro Ohtsuka² (1. Osaka Metropolitan Univ. Sci., 2. Nagoya Univ. Sci. IMaSS.)

Oral presentation | R5: Extraterrestrial materials

2:00 PM - 3:30 PM JST | 5:00 AM - 6:30 AM UTC | ES025 Higashiyama Campus

R5: Extraterrestrial materials

Chairperson: Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Toru Matsumoto (Kyoto University)

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

[R5-11] Mineralogy of micrometeoroids captured in silica aerogel aboard the ISS by the Dandelion Project

*Takaaki NOGUCHI¹, Akira MIYAKE¹, Hikaru Yabuta², Yoko Kebukawa³, Daiki Suga⁴, Makoto Tabata⁵, Kyoko Okudaira⁶, Akihiko Yamagishi⁷, Hajime Yano⁸ (1. Kyoto University, 2. Hiroshima University, 3. Tokyo Institute of Technology, 4. JASRI, 5. Chiba University, 6. University of Aizu, 7. Tokyo University of Pharmacy and Life Sciences, 8. JAXA)

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

[R5-12] STEM analysis of sodium-rich grains recovered from asteroid Ryugu

*Toru MATSUMOTO¹, Takaaki Noguchi¹, Toru Araki², Hayato Yuzawa², Akira Miyake¹ (1. Kyoto University, 2. UVSOR)

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

[R5-13] Important occurrence of amorphous hydrated Na-bearing Mg phosphate in Asteroid Ryugu samples and CI chondrites

*Takashi MIKOUCHI¹, Hideto Yoshida², Satoru Hayashi², Minami Masuda², Hiroyuki Kagi², Kazumasa Sugiyama³, Tomoki Nakamura⁴, Michael Zolensky⁵ (1. Univ. Museum, Univ. of Tokyo, 2. Fac. of Sci., Univ. of Tokyo, 3. Inst. Mat. Res., Tohoku Univ., 4. Fac. of Sci., Tohoku Univ., 5. NASA-JSC)

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

[R5-14] On the relationship between lithological classification and degree of aqueous alteration in Asteroid Ryugu samples

*Minami Masuda¹, Takashi Mikouchi², Hideto Yoshida¹, Tomoki Nakamura³, Michael Zolensky⁴ (1. Univ. Tokyo, Sci., 2. Univ. Tokyo, Univ. Museum, 3. Tohoku Univ., Sci., 4. NASA-JSC)

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

[R5-15] Highly primitive clasts with GEMS-like grains in Ryugu C0002 sample

*Megumi MATSUMOTO¹, Akira Tsuchiyama^{2,3}, Masahiro Yasutake⁴, Tomoki Nakamura¹ (1. Tohoku Univ., 2. Ritsumeikan Univ., 3. GIG, 4. JASRI/SPRING-8)

3:15 PM - 3:30 PM JST | 6:15 AM - 6:30 AM UTC

[R5-16] Aqueous alteration experiments using GEMS simulant particles

*Akira TSUCHIYAMA^{1,2}, Satomi Enju³, Haiyang Xian¹, Mingqi Sun¹, Ding Xing¹, Yuanyuan Wang⁴, Zhaolu He¹, Jing Du¹, Shan Li¹, Jiaxin Xi¹, Xiaojun Lin¹, Jian Di¹, Yuto Imura⁵ (1. Guangzhou Inst. Geochem., 2. Ritsumeikan Univ., 3. Ehime Univ. Sci., 4. Tokyo Univ. Sci., 5. Kyoto Univ. Sci.)

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

📅 Sat. Sep 14, 2024 9:00 AM - 12:00 PM JST | Sat. Sep 14, 2024 12:00 AM - 3:00 AM UTC | 🏢 ES Hall Higashiyama Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson: Tatsuhiko Kawamoto (Shizuoka University), Takashi Yuguchi, Atsushi Kamei

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

[R6-01] Compositional evolution of slab-derived fluids during ascent and origin of subduction-zone primary magmas: Implications from trace-element partition between hydrous melts and Cl-free or Cl-rich aqueous fluids

*Hajime TANIUCHI¹, Tatsuhiko KAWAMOTO², Takayuki NAKATANI¹, Osamu ISHIZUKA¹, Toshihiro SUZUKI¹, Akihiko Tomiya¹ (1. GSJ, AIST, 2. Shizuoka Univ.)

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

[R6-02] New crust and mantle physical properties research from the development of rock synthesis methods

「招待講演」

*Sanae Koizumi¹ (1. The University of Tokyo)

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

[R6-03] The use of contact metamorphism to identify plutons associated with major contemporaneous eruption and estimate magma flux

*Simon R WALLIS¹, Ken Yamaoka², Akira Miyake³, Catherine Annen⁴ (1. The University of Tokyo, 2. AIST, 3. Aichi University of Education, 4. Institute of Geophysics, Czech Academy of Sciences)

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

[R6-04] Petrography and geochronology of the Kuki granite, Kitakami Mountains, northeastern Japan: Shallow crustal intrusion and emplacement processes of granitic magma

*Satoshi SUZUKI¹, Takashi YUGUCHI², Keito ISHIGURO¹, Kyoka ENDO¹, Asuka KATO¹, Kosuke YOKOYAMA¹, Yasuhiro OGITA³, Tatsunori YOKOYAMA³, Shuhei SAKATA⁴, Takeshi OHNO⁵, Eiji SASAO³ (1. Yamagata University, 2. Kumamoto University, 3. Japan Atomic Energy Agency, 4. University of Tokyo, 5. Gakushuin University)

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

[R6-05] Zircon U-Pb dating of granitoids in the Hobenzan area, western Yamaguchi Prefecture, southwest Japan

*Yukiyasu TSUTSUMI¹, Kenichiro TANI¹ (1. National Museum of Nature and Science)

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

[R6-06] Estimation of temperature and pressure conditions of granitoids in the eastern part of Shimane Prefecture, San'in Belt.

*Kai Nakahashi¹, Satoshi SAITO¹ (1. Ehime University Graduate School of Science and Engineering, Earth Science Division)

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

[R6-07] Primary magma of Cretaceous Northern Kyushu batholith: New approach from Cumulus rocks

*Keisuke ESHIMA¹, Masaaki OWADA¹, Atsushi KAMEI² (1. Yamaguchi Univ. Sci., 2. Shimane Univ.)

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

[R6-08] Origin of the Cretaceous ignimbrite flare-up in SW Japan

*Ken Yamaoka¹, Tokiyuki Morohoshi², Daisuke Sato¹, Kazuto Mikuni¹ (1. AIST, 2. Univ. Tokyo. Sci.)

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

[3Lecture-101-11-9add] 休憩

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

[R6-09] The genesis of garnet in the Quaternary rhyolite of Hime-shima volcanic group, EEast Kyushu, Southwest Japan Arc.

*Takehiro HIRAYAMA^{1,2}, Tomoyuki SHIBATA², Masako YOSHIKAWA² (1. Tokyo University, 2. Hiroshima University)

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

[R6-10] K–Ar ages and geochemical compositions of Early Pleistocene andesites from southern Kyushu, Japan

*Raiki YAMADA¹, Masakazu Niwa¹, Koji Umeda², Koshi Yagi³, Taisei Fujiwara³, Ikuo Okada³, Fukuka Kida¹ (1. Japan Atomic Energy Agency, 2. Hirosaki University, 3. Hiruzen Institute for Geology and Geochronology)

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

[R6-11] Thermal history of pluton formation from Sr diffusion in plagioclase: implications for magma flux estimation and identification of plutons associated with major eruptions

「発表賞エントリー」

*Tokiyuki Morohoshi¹, Simon Richard Wallis¹ (1. The University of Tokyo)

Compositional evolution of slab-derived fluids during ascent and origin of subduction-zone primary magmas: Implications from trace-element partition between hydrous melts and Cl-free or Cl-rich aqueous fluids

*Hajime TANIUCHI¹, Tatsuhiko KAWAMOTO², Takayuki NAKATANI¹, Osamu ISHIZUKA¹,
Toshihiro SUZUKI¹, Akihiko Tomiya¹

1. GSJ, AIST, 2. Shizuoka Univ.

Keywords: Primary magma, Slab-derived fluid, Partition coefficient, High-pressure and high-temperature experiment

New crust and mantle physical properties research from the development of rock synthesis methods

*Sanae Koizumi¹

1. The University of Tokyo

Keywords: Olivine, Mantle, Crust, Sample synthesis

The use of contact metamorphism to identify plutons associated with major contemporaneous eruption and estimate magma flux

*Simon R WALLIS¹, Ken Yamaoka², Akira Miyake³, Catherine Annen⁴

1. The University of Tokyo, 2. AIST, 3. Aichi University of Education, 4. Institute of Geophysics, Czech Academy of Sciences

Magmatic flux is an important factor controlling the heat and material transport in the continental crust; it is also thought to be a major control on the potential for any magma to erupt, and duration of eruption and time scale between major events. Plutons are a clear record of magma input into the earth's crust and volume estimates combined with geochronological studies have been used to estimate past magma flux rates. However, areas suitable for such studies are limited and this approach cannot assess possible loss of magma through associated volcanic eruption. Contact metamorphic aureoles developed around plutons record the thermal effects of magma input into the crust and their study provides a potential way to use the geological record to estimate ancient magma flux rates even if material has been lost from the system by eruption.

A compilation of aureoles surrounding silicic plutons around the world shows that there is a wide variation in normalized thicknesses. Comparison with thermal modelling shows some aureoles are compatible with rapid input of the entire volume of magma recorded in the pluton whereas other aureoles are very narrow and imply slow rates of magma input. There are also numerous examples of aureoles broader than can be explained easily by either instantaneous intrusion models or incremental growth of plutons. Such broad aureoles may be explained by 1) unusually high crustal temperatures just before intrusion and 2) the contribution of magma that has subsequently been lost from the pluton system due to eruption.

The Shinshiro tonalite and the Busetsu granite are two plutons formed in the same Hongusan area and have similar zircon U–Pb ages. Although the Busetsu granite has a larger volume, it is associated with a much narrower aureole than the Shinshiro tonalite. Because the intrusions formed at the same time in the same area, the difference in aureole widths cannot be explained by contrasting background crustal temperatures. Thermal modeling shows that only eruptive loss of magma can adequately account for the characteristics of the Shinshiro tonalite aureole. Combining petrological studies of metamorphic aureoles with thermal modeling can identify plutons that developed in association with major volcanic eruptions and constrain ancient magma flux.

Keywords: Magma flux, Pluton, Contact metamorphism

Petrography and geochronology of the Kuki granite, Kitakami Mountains, northeastern Japan: Shallow crustal intrusion and emplacement processes of granitic magma

*Satoshi SUZUKI¹, Takashi YUGUCHI², Keito ISHIGURO¹, Kyoka ENDO¹, Asuka KATO¹, Kosuke YOKOYAMA¹, Yasuhiro OGITA³, Tatsunori YOKOYAMA³, Shuhei SAKATA⁴, Takeshi OHNO⁵, Eiji SASAO³

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

Keywords: Flare-up, Non-adakitic magma, Fractional crystallization, P-T history, t-T history

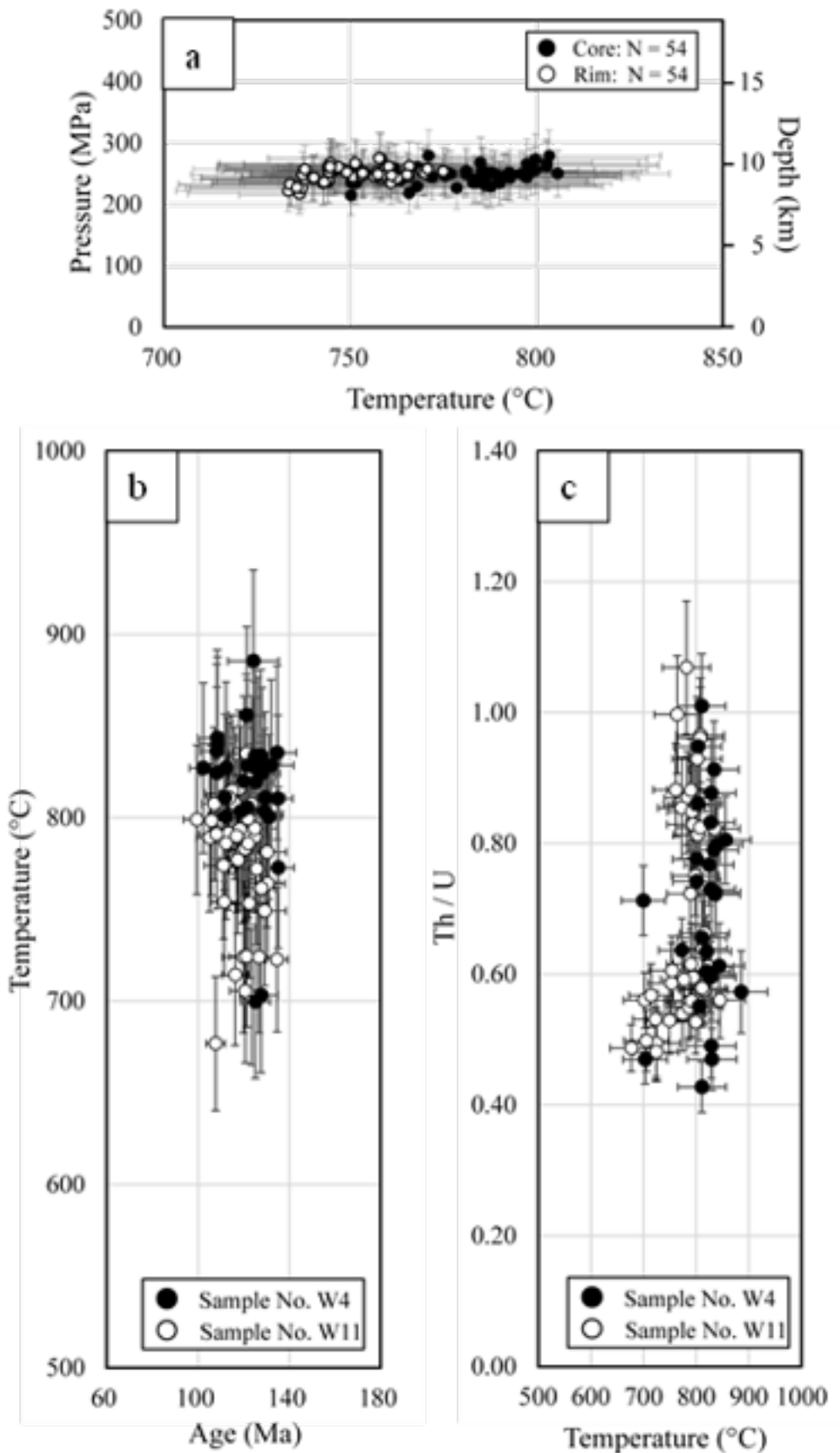


図1 久喜花崗岩体のホルンブレンドから導出した温度と圧力（深度）の関係（a）、ジルコンU-Pb年代・Ti濃度・Th/U比の同時測定による t - T 履歴（b）とTh/U比と温度の関係（c）。

Zircon U-Pb dating of granitoids in the Hobenzan area, western Yamaguchi Prefecture, southwest Japan

*Yukiyasu TSUTSUMI¹, Kenichiro TANI¹

1. National Museum of Nature and Science

Zircons U-Pb ages were obtained from granitoids in the Hobenzan area, western Yamaguchi Prefecture, southwest Japan. Granitoid bodies in the area consist of granodiorite and granite. The 5 granodioritic samples indicate 95.4 ± 0.7 Ma, 96.3 ± 1.0 Ma, 96.3 ± 0.8 Ma, 96.2 ± 0.6 Ma and 97.1 ± 0.7 Ma whereas the 2 granitic samples indicate 93.9 ± 0.7 Ma and 90.2 ± 0.8 Ma. Errors are 95% confidence intervals. These ages are equivalent of the granitoids in northern Kyushu, but there is no report for granitoid which age is more than 95 Ma from eastern Chugoku District. Additional research is necessary to verify the chronological continuation of granitoids in SW Japan.

Keywords: SW Japan, San-yo Province, Cretaceous, granitoid, zircon U-Pb age

Estimation of temperature and pressure conditions of granitoids in the eastern part of Shimane Prefecture, San'in Belt.

*Kai Nakahashi¹, Satoshi SAITO¹

1. Ehime University Graduate School of Science and Engineering, Earth Science Division

Keywords: granitoids, Amphibole only geothermobarometer, San-in granitoids

Primary magma of Cretaceous Northern Kyushu batholith: New approach from Cumulus rocks

*Keisuke ESHIMA¹, Masaaki OWADA¹, Atsushi KAMEI²

1. Yamaguchi Univ. Sci., 2. Shimane Univ.

The Jurassic to Cretaceous igneous rocks associated with the subduction of the Izanagi Plate are widely developed in the Northeast Asian continental margin and have been intensively studied for their igneous activity and tectonics (Kim et al., 2016, *Lithos* 262, 88–106; Yu et al. et al., 2021, *Int. Geol. Rev.*, 1881920). It is clear that the igneous rocks in the Japanese Islands, as well as the continental side (Northeastern China and Korean Peninsula), are related to the subduction (200–50 Ma) of the Izanagi Plate into Eurasia (Seton et al., 2015, *Geophys. Res. Lett.* 42, 1732–1740), and approximately 30% of Japan archipelago is occupied by plutons, typically granitoid. In addition, large-scale granitic complexes with an area of more than 100 km², known as batholiths, are exposed throughout the Japanese island and compose the major part of this island arc crust. Furthermore, about 80% of the granitoids exposed in Japan are concentrated in the geochronological age range 50–130 Ma (mainly Cretaceous to Paleogene). These continental-scale periodic large-scale igneous events are called Magmatic flare-ups and are very important for the mechanism of generation of large amounts of silicic magma and the evolution of crustal growth processes (Ducea, 2001, *GSA Today*, 11, 4–10). In this presentation, we discuss a comprehensive study of the Cretaceous Northern Kyushu Batholith, including magma generation mechanisms, especially the formation process and generation mechanisms of source magmas of the granitoids that form the batholith-scaled pluton. In addition, the source magmas will be examined using the Cumulus rocks from the Kita-Taku mafic complex associated with the Cretaceous Northern Kyushu batholith. We believe that the use of the cumulus minerals from the primary magma and the tracing of the characteristics of the primary magma is the best approach in the Northern Kyushu batholith, where there are very few exposures of coeval volcanic rocks (i.e., it is difficult to determine the melt composition from volcanic rocks).

Keywords: Cretaceous Northern Kyushu Batholith, Kita-taku mafic complex, Cumulate, Primary magma, Sanukitic HMA

Origin of the Cretaceous ignimbrite flare-up in SW Japan

*Ken Yamaoka¹, Tokiyuki Morohoshi², Daisuke Sato¹, Kazuto Mikuni¹

1. AIST, 2. Univ. Tokyo. Sci.

Keywords: Cretaceous, flare-up, isotope ratio, magma, southwest Japan

Oral presentation

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson: Tatsuhiko Kawamoto (Shizuoka University), Takashi Yuguchi, Atsushi Kamei

Sat. Sep 14, 2024 9:00 AM - 12:00 PM ES Hall (Higashiyama Campus)

11:00 AM - 11:15 AM

[3Lecture-101-11-9add]休憩

The genesis of garnet in the Quaternary rhyolite of Hime-shima volcanic group, EEast Kyushu, Southwest Japan Arc.

*Takehiro HIRAYAMA^{1,2}, Tomoyuki SHIBATA², Masako YOSHIKAWA²

1. Tokyo University, 2. Hiroshima University

Keywords: Garnet, Rhyolite, Xenocryst, Hime-shima volcanic group

K–Ar ages and geochemical compositions of Early Pleistocene andesites from southern Kyushu, Japan

*Raiki YAMADA¹, Masakazu Niwa¹, Koji Umeda², Koshi Yagi³, Taisei Fujiwara³, Ikuo Okada³, Fukuka Kida¹

1. Japan Atomic Energy Agency, 2. Hirosaki University, 3. Hiruzen Institute for Geology and Geochronology

Keywords: Kyushu, Early Pleistocene, Volcanic front, Andesite

Thermal history of pluton formation from Sr diffusion in plagioclase: implications for magma flux estimation and identification of plutons associated with major eruptions

*Tokiyuki Morohoshi¹, Simon Richard Wallis¹

1. The University of Tokyo

Keywords: pluton formation, chemical diffusion, magma flux, Ryoke plutonic rocks

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

📅 Sat. Sep 14, 2024 9:00 AM - 12:00 PM JST | Sat. Sep 14, 2024 12:00 AM - 3:00 AM UTC | 🏠 ES024 Higashiyama Campus

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

Chairperson: Fumiya Noritake, Mariko Nagashima, Makoto Tokuda

9:00 AM - 9:20 AM JST | 12:00 AM - 12:20 AM UTC

[R2-01] Changes of physical and structural properties of hydrous minerals induced by dehydration of coordinated water molecules

「招待講演」

*Ryo YAMANE¹ (1. Tohoku University)

9:20 AM - 9:35 AM JST | 12:20 AM - 12:35 AM UTC

[R2-02] Phase change of priceite $\text{Ca}_2\text{B}_5\text{O}_7(\text{OH})_5 \cdot \text{H}_2\text{O}$ during thermal decomposition

*Atsushi KYONO¹, Kosuke Yamaguchi¹, Satoru Okada¹, Hiroki Hasegawa¹ (1. Life & Environmental Sciences, University of Tsukuba)

9:35 AM - 9:50 AM JST | 12:35 AM - 12:50 AM UTC

[R2-03] The incorporation mechanisms of water in aluminous orthoenstatite clarified via comprehensive NMR measurements and first-principles calculations

*Xianyu XUE¹, Masami Kanzaki¹, Rongzhang Yin² (1. Okayama University, 2. Peking University)

9:50 AM - 10:05 AM JST | 12:50 AM - 1:05 AM UTC

[R2-04] Evaluation of the influence of polishing condition on hydrogen diffusion in fluorapatite and estimation of the diffusion mechanism

「発表賞エントリー」

*Chikashi Yoshimoto¹, Isao Sakaguchi², Shoichi Itoh¹ (1. Kyoto University, 2. NIMS)

10:05 AM - 10:20 AM JST | 1:05 AM - 1:20 AM UTC

[R2-05] Evaporation kinetics of forsterite in low-pressure H_2 - H_2O atmosphere

「発表賞エントリー」

*Shiori Inada¹, Shogo Tachibana¹ (1. The University of Tokyo)

10:20 AM - 10:30 AM JST | 1:20 AM - 1:30 AM UTC

[3Lecture-201-11-6add] 休憩

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

[R2-06] Origine of framboidal goethite in sandstone in the Saiki Subgroup of the Lower Shimanto Group

*Hiroaki OHFUJI¹, Seira Konishi¹, Hiroshi Yamamoto² (1. Tohoku Univ. Sci, 2. Kagoshima Univ. Sci)

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

[R2-07] Precursor phenomenon of ultrananolite crystallization: liquid immiscibility in the volcanic glass

*Mayumi Mujin¹, Keiko Matsumoto², Akira Miyake³, Yohei Igami³, Michihiko Nakamura¹, Akihiko Yokoo³, Mitsuhiro Yoshimoto⁴ (1. Tohoku University, 2. National Institute of Advanced Industrial Science and Technology (AIST), 3. Kyoto University, 4. Mount Fuji Research Institute, Yamanashi Prefectural Government)

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

[R2-08] Calorimetric constraint of cation disordering enthalpy in MgAl_2O_4 spinel

*Hiroshi KOJITANI¹, Ryuji Matsuki¹, Yuta Nishimura¹, Itaru Ohira¹ (1. Gakushuin University)

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

[R2-09] Solid solubilities of Na^+ and K^+ in perovskite type SrTiO_3

Ryogo KITAI², *Takaya NAGAI¹, Jun KAWANO¹, Ayako Shinozaki¹ (1. Hokkaido Univ. Faculty Sci., 2. Hokkaido Univ. School Sci.)

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

[R2-10] Study on the consistency of Li conductivity measurements of $(\text{Li,Li})\text{TiO}_3$ with perovskite structure and Li migration during SIMS measurements

*Isao SAKAGUCHI¹, Tsuyoshi Onishi¹ (1. National Institute for Materials Science)

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

[R2-11] Structure transition mechanism under high pressure of Fe-Ti-O system phases

*Takamitsu YAMANAKA^{1,2}, Takanori Hattori³, Ho-kwang Mao¹ (1. Center for High Pressure Science and Technology Advanced Research, 2. Graduate School of Science Osaka University, 3. J-PARC)

Changes of physical and structural properties of hydrous minerals induced by dehydration of coordinated water molecules

*Ryo YAMANE¹

1. Tohoku University

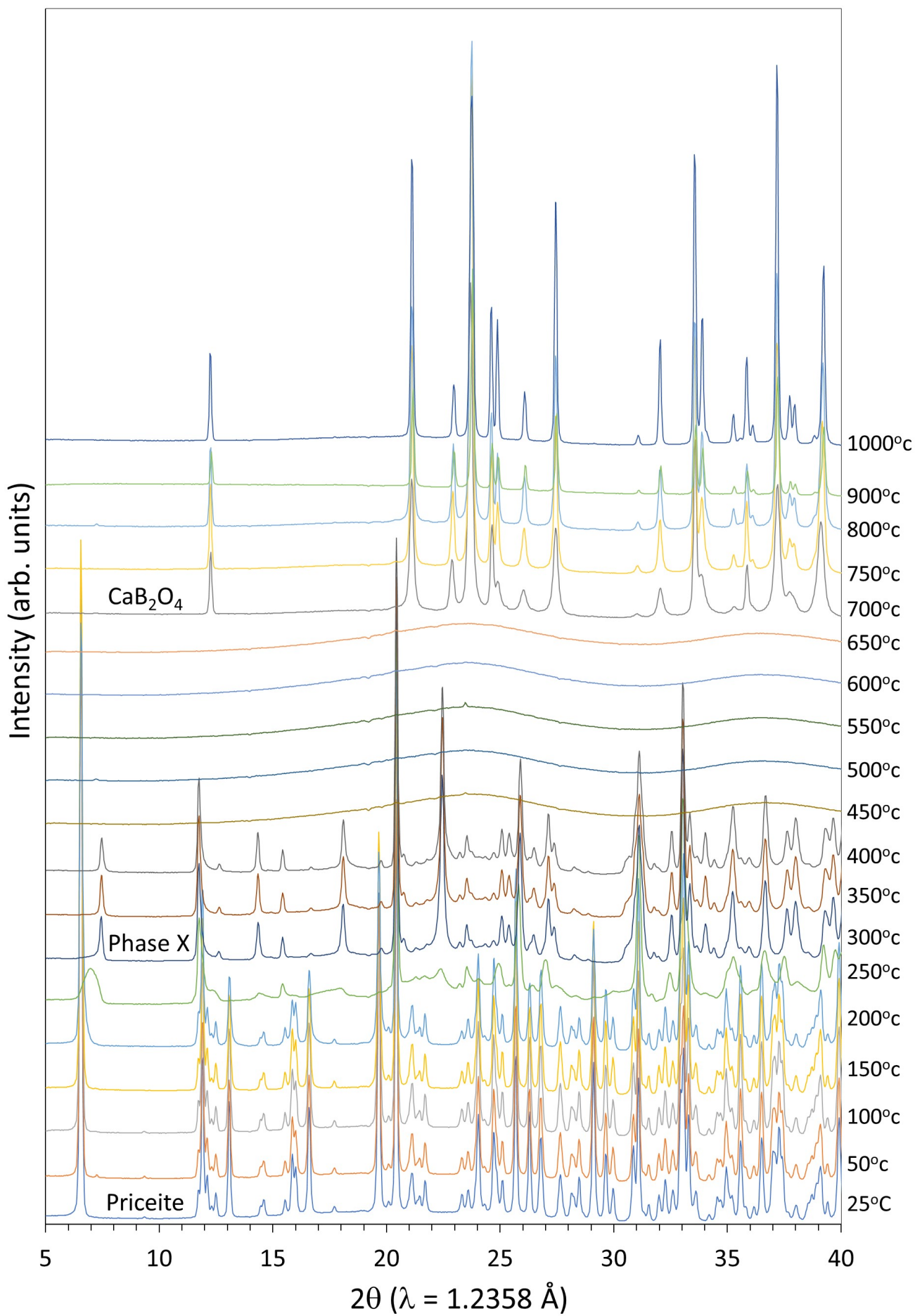
Keywords: hydrous mineral, dehydration, vivianite, coordinated water molecule

Phase change of priceite $\text{Ca}_2\text{B}_5\text{O}_7(\text{OH})_5\cdot\text{H}_2\text{O}$ during thermal decomposition

*Atsushi KYONO¹, Kosuke Yamaguchi¹, Satoru Okada¹, Hiroki Hasegawa¹

1. Life & Environmental Sciences, University of Tsukuba

Keywords: Priceite, Borate mineral, Thermal decomposition, Synchrotron X-ray Diffraction



The incorporation mechanisms of water in aluminous orthoenstatite clarified via comprehensive NMR measurements and first-principles calculations

*Xianyu XUE¹, Masami Kanzaki¹, Rongzhang Yin²

1. Okayama University, 2. Peking University

Aluminum is an important minor element in natural orthopyroxene, which has been shown to significantly enhance its water incorporation capacity. However, the incorporation mechanisms remain speculative. We performed a comprehensive one- and two-dimensional ¹H, ²⁹Si and ²⁷Al NMR measurements on hydrous aluminous orthoenstatite (OEn) samples containing 4 to 8 wt% Al₂O₃ synthesized at 1.5 GPa and 900°C, and first-principles calculations on the energy, and NMR and polarized infrared spectra for anhydrous and hydrous aluminous OEn models to clarify the issue. The combined ¹H MAS and static NMR, ¹H double-quantum and triple-quantum MAS NMR, and ²⁷Al-¹H CP MAS NMR and HETCOR results, along with first-principles calculation results, unambiguously revealed that a large part of the incorporated water are present as proton pairs in Mg vacancies adjacent to Al, with one proton of each pair exhibiting significantly weaker hydrogen bonding, and accordingly smaller ¹H chemical shifts and higher OH stretching frequencies, than those in Al-free OEn, as a result of interaction with Al (see Figure). Proton pairs in Mg vacancies remote from Al are minor or absent. Coupled substitutions of Al + H for 1Si and 2Mg (both with weak hydrogen bonding) were also detected, but are less abundant than hitherto considered. Thus, the enhancement of water solubility by Al is achieved dominantly through the modification of the hydrogen bonding of protons in Mg vacancies. Such a mechanism may also be important in other nominally anhydrous mantle minerals. The obtained polarized IR spectral characteristics from our first-principles calculations also allow us to decipher the incorporation mechanisms of water in synthetic OEn of lower Al concentrations and natural orthopyroxenes of diverse origins from the polarized infrared data reported thus far.

Keywords: orthopyroxene, water, aluminum, NMR, first-principles calculation

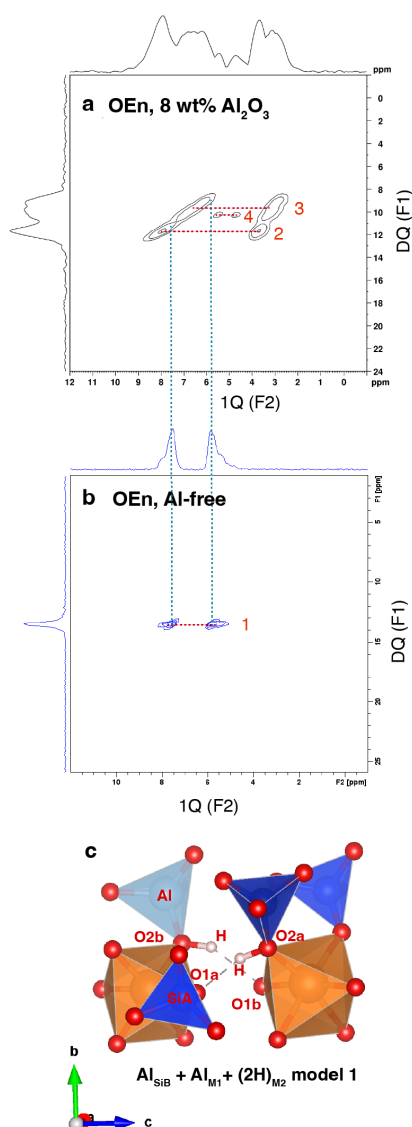


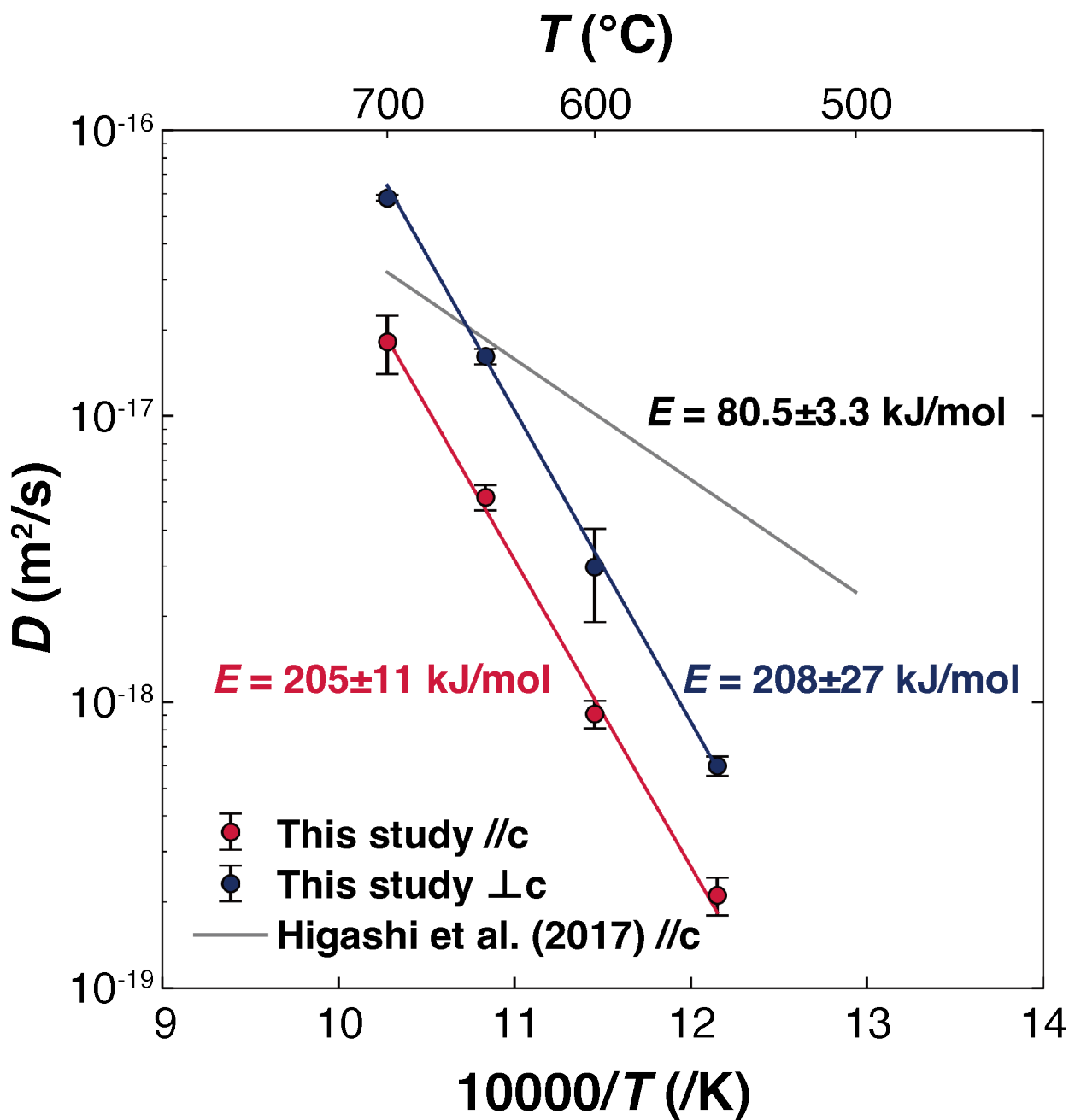
Figure. ¹H double-quantum (DQ)-single quantum (1Q) correlation MAS NMR spectrum for hydrous aluminous OEn with 8 wt% Al₂O₃ synthesized at 1.5 GPa and 900°C (a), compared with that for a hydrous MgSiO₃ OEn synthesized at 7 GPa and 1200°C (b). The horizontal dashed lines connect the observed proton pairs (labelled pair 1 to 4). Vertical lines are guides for the proton pair 1. Also shown in (c) is an example of energetically favorable 2H in an M₂ vacancy ((2H)_{M2}) model for aluminous OEn from first-principles calculation. The Al^{IV}-O_{2b}-H...O_{1b} linkage yields smaller ¹H chemical shift and higher OH stretching frequency than (2H)_{M2} defects in Al-free OEn.

Evaluation of the influence of polishing condition on hydrogen diffusion in fluorapatite and estimation of the diffusion mechanism

*Chikashi Yoshimoto¹, Isao Sakaguchi², Shoichi Itoh¹

1. Kyoto University, 2. NIMS

Keywords: apatite, hydrogen, diffusion, Secondary Ion Mass Spectrometry



Evaporation kinetics of forsterite in low-pressure H₂-H₂O atmosphere*Shiori Inada¹, Shogo Tachibana¹

1. The University of Tokyo

Keywords: forsterite, evaporation, kinetics

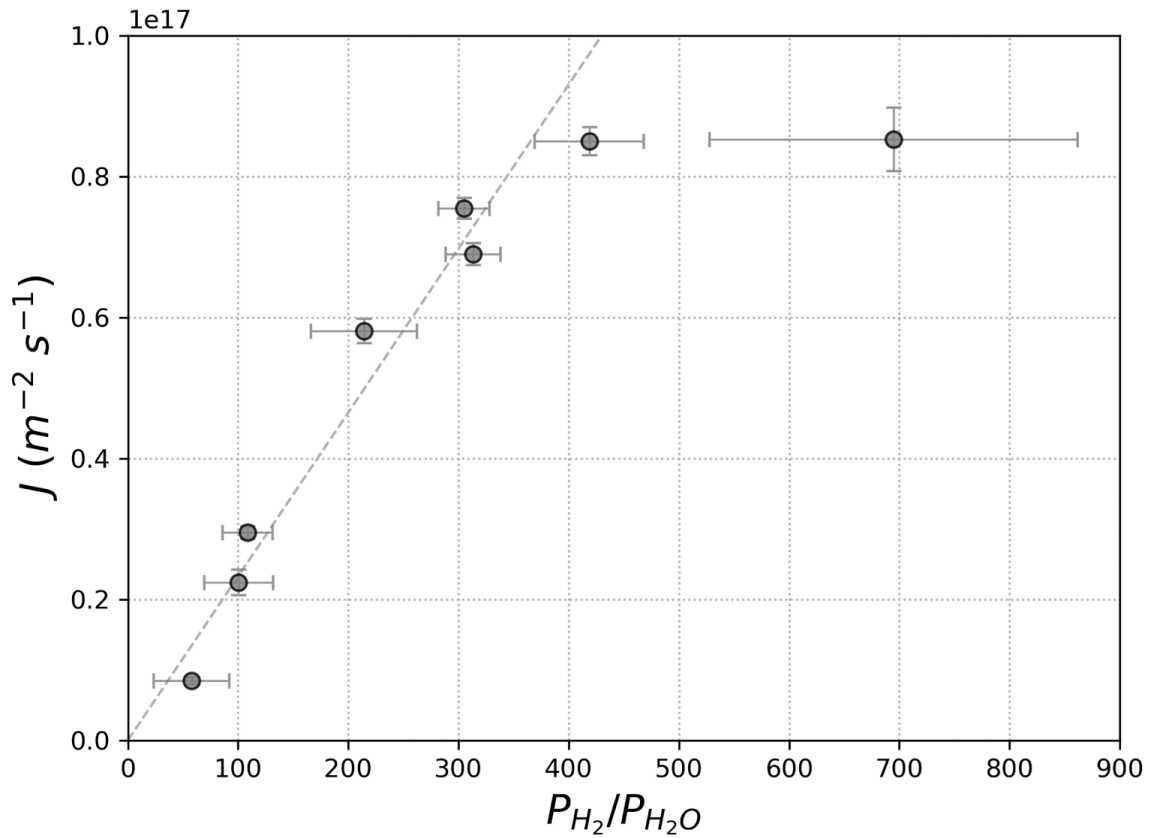


Fig. 1. 単位面積あたりの蒸発速度 J ($m^{-2} s^{-1}$) と雰囲気ガス組成 P_{H_2}/P_{H_2O} の関係 (全圧 1 Pa, 温度 1400 K) .

Oral presentation

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

Chairperson: Fumiya Noritake, Mariko Nagashima, Makoto Tokuda

Sat. Sep 14, 2024 9:00 AM - 12:00 PM ES024 (Higashiyama Campus)

10:20 AM - 10:30 AM

[3Lecture-201-11-6add]休憩

Origine of framboidal goethite in sandstone in the Saiki Subgroup of the Lower Shimanto Group

*Hiroaki OHFUJI¹, Seira Konishi¹, Hiroshi Yamamoto²

1. Tohoku Univ. Sci, 2. Kagoshima Univ. Sci

The raspberry-like framboidal aggregate is a unique crystallization texture that can be frequently seen in microscopic pyrite in sedimentary rocks and modern sediments. In this study, we conducted micro- and nano-scale analyses using SEM and TEM on iron oxide framboids, which were recently found by Egami et al. (2021) in sandstones of the Saiki Subgroup of the Lower Shimanto Group distributed in western Kagoshima, Japan, to understand their origin. The results show that framboidal aggregate are distributed locally in the sandstone and often form clusters and/or infilled textures. Framboids are mostly surrounded by clay minerals produced by hydrothermal alteration, but no sulfur-containing minerals such as pyrite and sulfate minerals were observed. TEM observation on thin foils prepared by FIB showed that microcrystals that constitute framboids are not single crystals, but are filled by assemblages of nano-sized crystals with a concentric layer pattern, which consists of several alternating layers of goethite nanocrystals and a mixture of clay minerals and amorphous silica. The goethite nanocrystals grew inward from the microcrystal outline, indicating that they were formed by alternation (replacement) of pyrite microcrystals. These observations suggest goethite framboids are pseudomorphs after pyrite framboids, which formed in the interstitial spaces in the formation during diagenesis.

Keywords: Framboida goethite, Framboidal pyrite, Clay mineral, Alteration

Precursor phenomenon of ultrananolite crystallization: liquid immiscibility in the volcanic glass

*Mayumi Mujin¹, Keiko Matsumoto², Akira Miyake³, Yohei Igami³, Michihiko Nakamura¹, Akihiko Yokoo³, Mitsuhiro Yoshimoto⁴

1. Tohoku University, 2. National Institute of Advanced Industrial Science and Technology (AIST), 3. Kyoto University, 4. Mount Fuji Research Institute, Yamanashi Prefectural Government

Keywords: liquid immiscibility, ultrananolite, nanocrystal, volcanic glass

Calorimetric constraint of cation disordering enthalpy in MgAl_2O_4 spinel

*Hiroshi KOJITANI¹, Ryuji Matsuki¹, Yuta Nishimura¹, Itaru Ohira¹

1. Gakushuin University

Keywords: spinel, cation disorder, calorimetry, enthalpy of disordering, thermodynamics

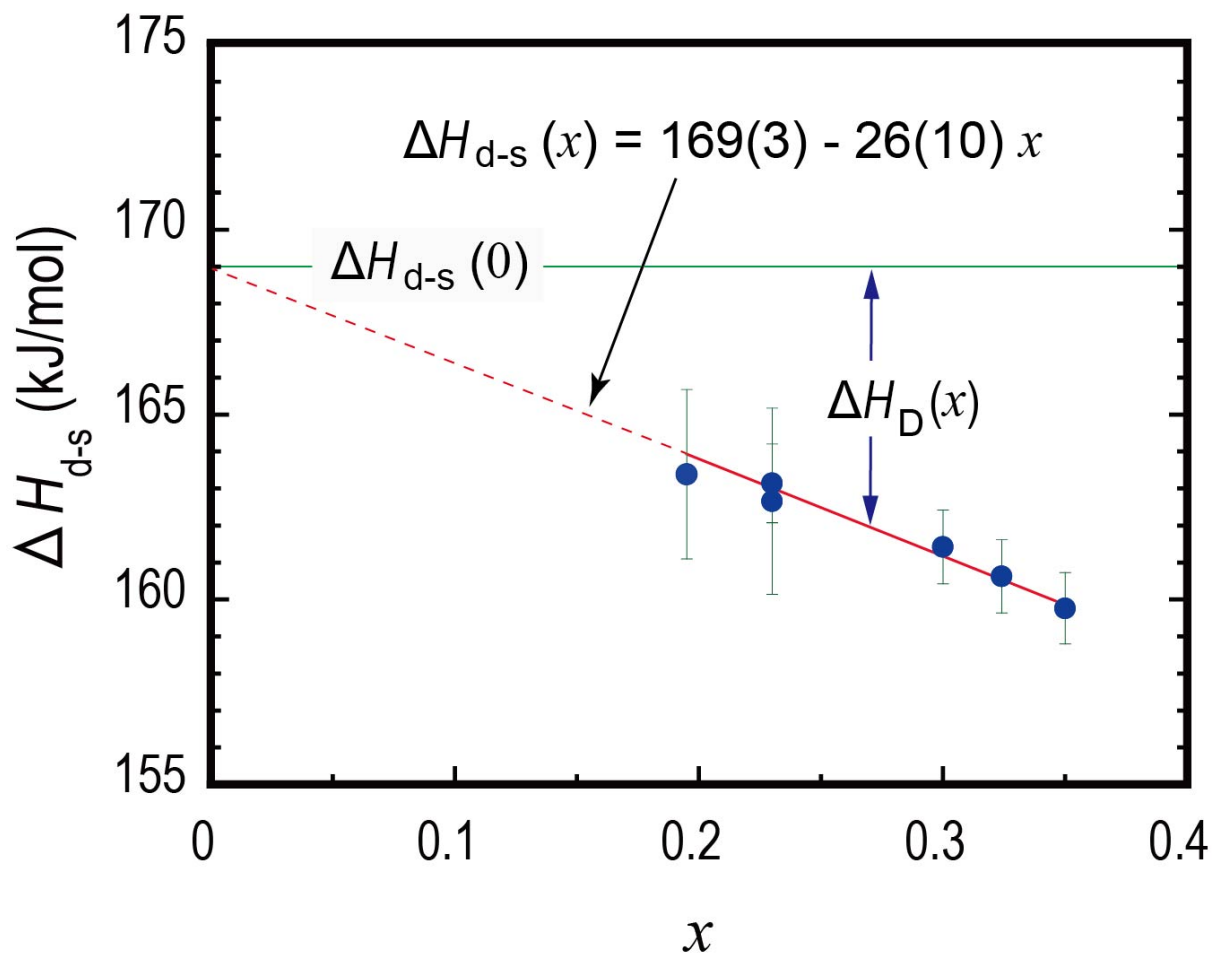


Fig. 1. 様々な陽イオン無秩序化の程度を持つ MgAl_2O_4 スピネルの落下溶解エンタルピー測定結果

Solid solubilities of Na⁺ and K⁺ in perovskite type SrTiO₃

Ryogo KITAI², *Takaya NAGAI¹, Jun KAWANO¹, Ayako Shinozaki¹

1. Hokkaido Univ. Faculty SCi., 2. Hokkaido Univ. School SCi.

In this study, we report the results of synthetic experiments investigating the solid solubilities of Na⁺ and K⁺ in perovskite-type SrTiO₃. According to Shannon (1976), the ionic radii of Na⁺ and K⁺ at a 6-coordinate site are significantly larger than that of Ti⁴⁺, while their ionic radii at a 12-coordinate site are comparable to that of Sr²⁺. Assuming that Na⁺ and K⁺ only exchange with Sr²⁺, this solid solution mechanism would result in the formation of oxygen vacancies.

Keywords: perovskite structure, SrTiO₃, Na, K, oxygen vacancy

Study on the consistency of Li conductivity measurements of (Li,La)TiO₃ with perovskite structure and Li migration during SIMS measurements

*Isao SAKAGUCHI¹, Tsuyoshi Onishi¹

1. National Institute for Materials Science

Introduction

Research and development for carbon neutrality is widely conducted. Among of these, many resources are devoted to these regarding all-solid-state lithium secondary batteries. Many oxides are proposed as electrolytes for all-solid-state lithium batteries. Among of these, we focus on (Li,La)TiO₃ with perovskite structure. Secondary ion mass spectrometry, which is advantageous for light element analysis, is impossible to analyze Li in this material at room temperature. This time, we tried a method to Li battery electrolytes.

Experiment

(Li,La)TiO₃ (hereinafter referred to as LLT) can be purchased in plates, disks, powder, etc. from Toho Titanium Co., Ltd. At this time, we used a plate shape as a standard sample. A comparative sample for this was newly synthesized. The analysis used SIMS (CAMECA, IMS-4f) equipped with NIMS, and O⁻ as primary ions was used and positive secondary ions were detected.

Results and Discussion

Figure 1 shows the analysis results of the purchased LLT. Figure 1(a) is Li image immediately after primary ion irradiation, and Li showed the uniform intensity, and some precipitates with high intensity were observed. Figure 1(b) is Li image after continuous irradiation with O⁻. Obvious non-uniformity of Li was observed in the image. Considering this, the Li intensity distribution in Figure 1(b) reflects the micro-structure within the sample. When primary ions, O⁻, are irradiated during analysis, the irradiated area becomes negative charge, and then Li with positive charge moves to compensate for its charge. The region where Li has changed to a high intensity is a large grain, and the Li conductivity reaches 1×10^{-3} S/cm. It is thought that because the current density of primary ions is small, Li that has migrated to the surface reacts with oxygen and generates LiO_x. it is considered that such non-uniform Li intensity was generated because the amount of Li movement within the disk was small.

Summary

In materials such as the electrolyte in Li batteries, Li moves through the material at room temperature. This research revealed that Li can be moved by changing the charge state on the surface through primary ion irradiation, and that the migration path of Li is the same as that of movement known by electrical measurements.

Keywords: Perovskite structure

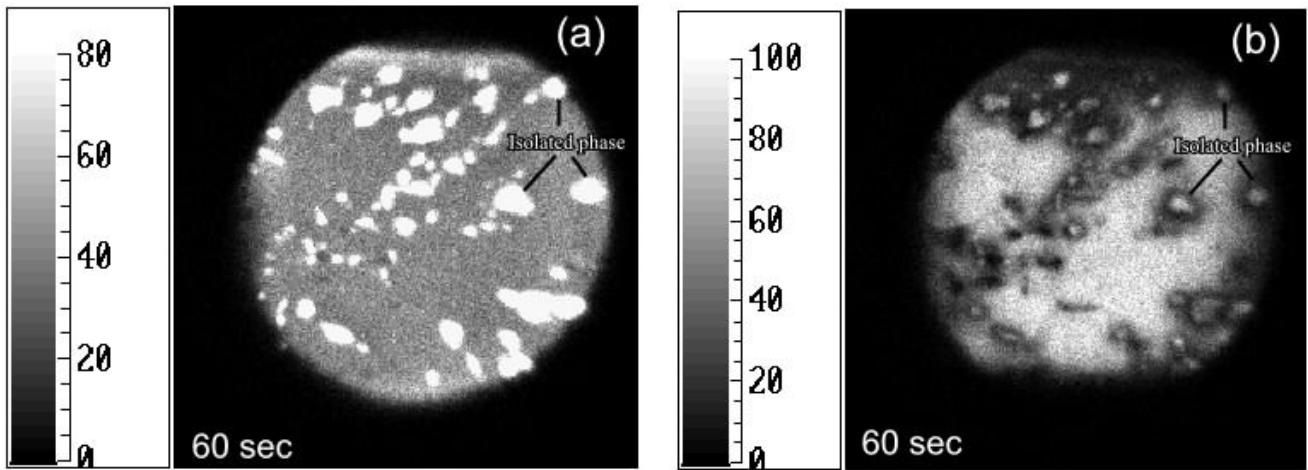


Fig. 1. Li images obtained by SIMS. (a) is the first image by O- irradiation. (b) is the image obtained after about 1.5 hours.

Structure transition mechanism under high pressure of Fe-Ti-O system phases

*Takamitsu YAMANAKA^{1,2}, Takanori Hattori³, Ho-kwang Mao¹

1. Center for High Pressure Science and Technology Advanced Research, 2. Graduate School of Science Osaka University, 3. J-PARC

Keywords: ulvöspinel, ilmenite, pseudobrookite

Oral presentation | R5: Extraterrestrial materials

📅 Sat. Sep 14, 2024 9:00 AM - 12:00 PM JST | Sat. Sep 14, 2024 12:00 AM - 3:00 AM UTC | 🏠 ES025
Higashiyama Campus

R5: Extraterrestrial materials

Chairperson: Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Toru Matsumoto (Kyoto University)

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

[R5-01] Revealing Chemical Compositional Variety of Amorphous Silicate Dust around AGB Stars by Condensation Experiment and Spectroscopic Analysis

「発表賞エントリー」

*Hanako Enomoto¹, Aki Takigawa¹, Hiroki Chihara², Chiyoe Koike² (1. UTokyo, 2. Osaka Sangyo univ.)

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

[R5-02] Formation process of circumstellar dust studied from presolar oxides in carbonaceous chondrite DOM 08006.

「発表賞エントリー」

*Hiroyuki Hashizume¹, Aki Takigawa¹ (1. UTokyo EPSS)

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

[R5-03] Progress of irreversible chemical reactions on dust moving in a protoplanetary disk

*Lily Ishizaki¹, Shogo Tachibana¹ (1. UT EPS)

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

[R5-04] Experimental study of the effect of evaporation during temperature rise on type B CAI formation

「発表賞エントリー」

*Yasuaki Tsuruoka¹, Shogo Tachibana¹ (1. UTokyo Sci.)

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

[R5-05] Chondrule formation by collisions of planetesimals containing volatiles

「招待講演」

*Sin-iti Sirono¹ (1. Navoya Univ.)

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

[3Lecture-301-10-6add] 休憩

10:35 AM - 10:55 AM JST | 1:35 AM - 1:55 AM UTC

[R5-06] Constraining the true timescale of chondrule formation through chondrule mineral chemistry

「招待講演」

*Kohei Fukuda¹, Noriko T Kita², Makoto Kimura³ (1. Osaka Univ. Sci., 2. UW-Madison, 3. NIPR)

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

[R5-07] Reproduction Experiments of Radial Pyroxene Chondrules Using a Gas-jet Levitation System under Reducing Conditions

「発表賞エントリー」

*Kana Watanabe¹, Tomoki Nakamura¹, Tomoyo Morita¹ (1. Tohoku Univ. Sci.)

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

[R5-08] Stratigraphy of poikilitic shergottite parent body(ies) as deduced from their textural and mineral compositional diversities

「発表賞エントリー」

*Sojiro Yamazaki¹, Akira Yamaguchi², Takashi Mikouchi³ (1. Fac. Sci., Univ. Tokyo, 2. Natl. Inst. Polar Res., 3. Univ. Museum, Univ. Tokyo)

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

[R5-09] High pressure phase transition of Ti-Cr-rich spinel in Asuka 12325 Martian meteorite

*Atsushi TAKENOUCHI¹, Yohei Igami², Takashi Mikouchi³, Akira Miyake², Akira Yamaguchi⁴ (1. The Kyoto Univ. Museum, 2. Kyoto Univ. Sci., 3. The Univ. Museum, The Univ. of Tokyo, 4. NIPR)

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

[R5-10] Estimation of thermal history using silica minerals in mesosiderites

*Haruka OONO¹, Atsushi Takenouchi², Takashi Mikouchi³, Akira Yamaguchi⁴, Naoji Sugiura⁵, Akira Miyake¹ (1. Kyoto Univ., 2. Museum of Kyoto Univ., 3. Museum of Univ. Tokyo, 4. NiPR, 5. Chiba Int. Tech.)

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

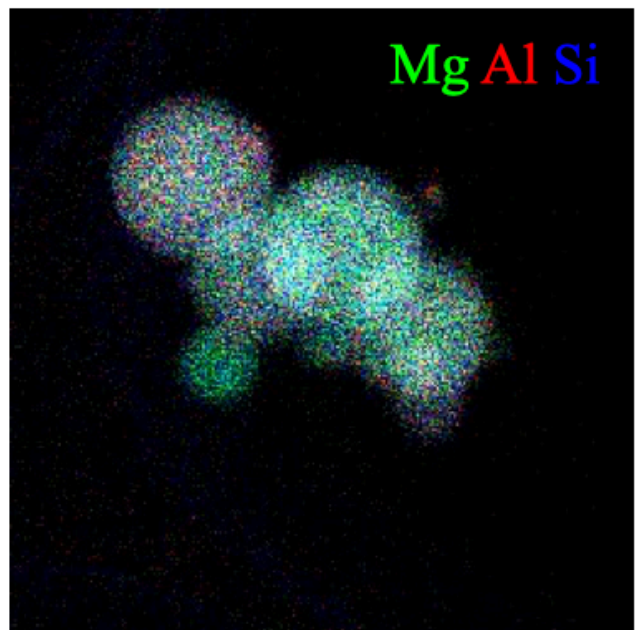
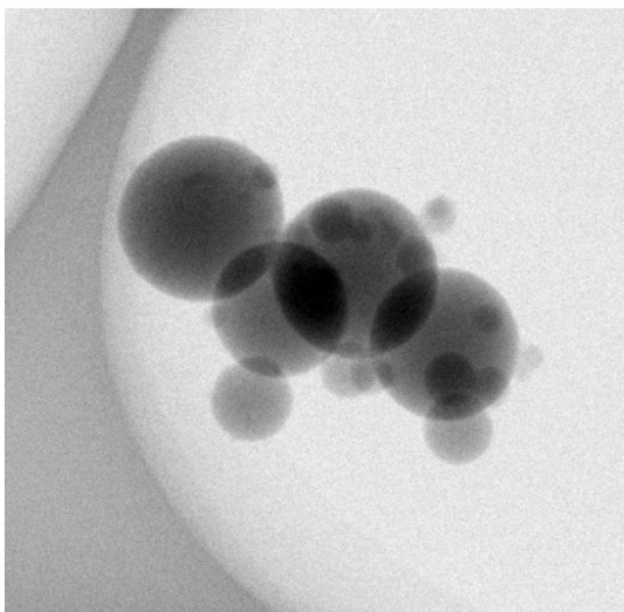
調整

Revealing Chemical Compositional Variety of Amorphous Silicate Dust around AGB Stars by Condensation Experiment and Spectroscopic Analysis

*Hanako Enomoto¹, Aki Takigawa¹, Hiroki Chihara², Chiyoe Koike²

1. UTokyo, 2. Osaka Sangyo univ.

Keywords: circumstellar dust, amorphous silicate, presolar grain, experiment, spectroscopy



200 nm

200 nm

実験で生成した非晶質ナノ粒子のSTEM-BF像(左)と
STEM-EDS元素マップ(右)

Formation process of circumstellar dust studied from presolar oxides in carbonaceous chondrite DOM 08006.

*Hiroyuki Hashizume¹, Aki Takigawa¹

1. UTokyo EPSS

Keywords: Presolar grains, meteorite, spinel, circumstellar dust, oxides

Progress of irreversible chemical reactions on dust moving in a protoplanetary disk

*Lily Ishizaki¹, Shogo Tachibana¹

1. UT EPS

Keywords: protoplanetary disk, protosolar disk, dust, Monte Carlo simulation

Experimental study of the effect of evaporation during temperature rise on type B CAI formation

*Yasuaki Tsuruoka¹, Shogo Tachibana¹

1. UTokyo Sci.

Keywords: CAIs, melting, evaporation, crystal growth, protosolar disk

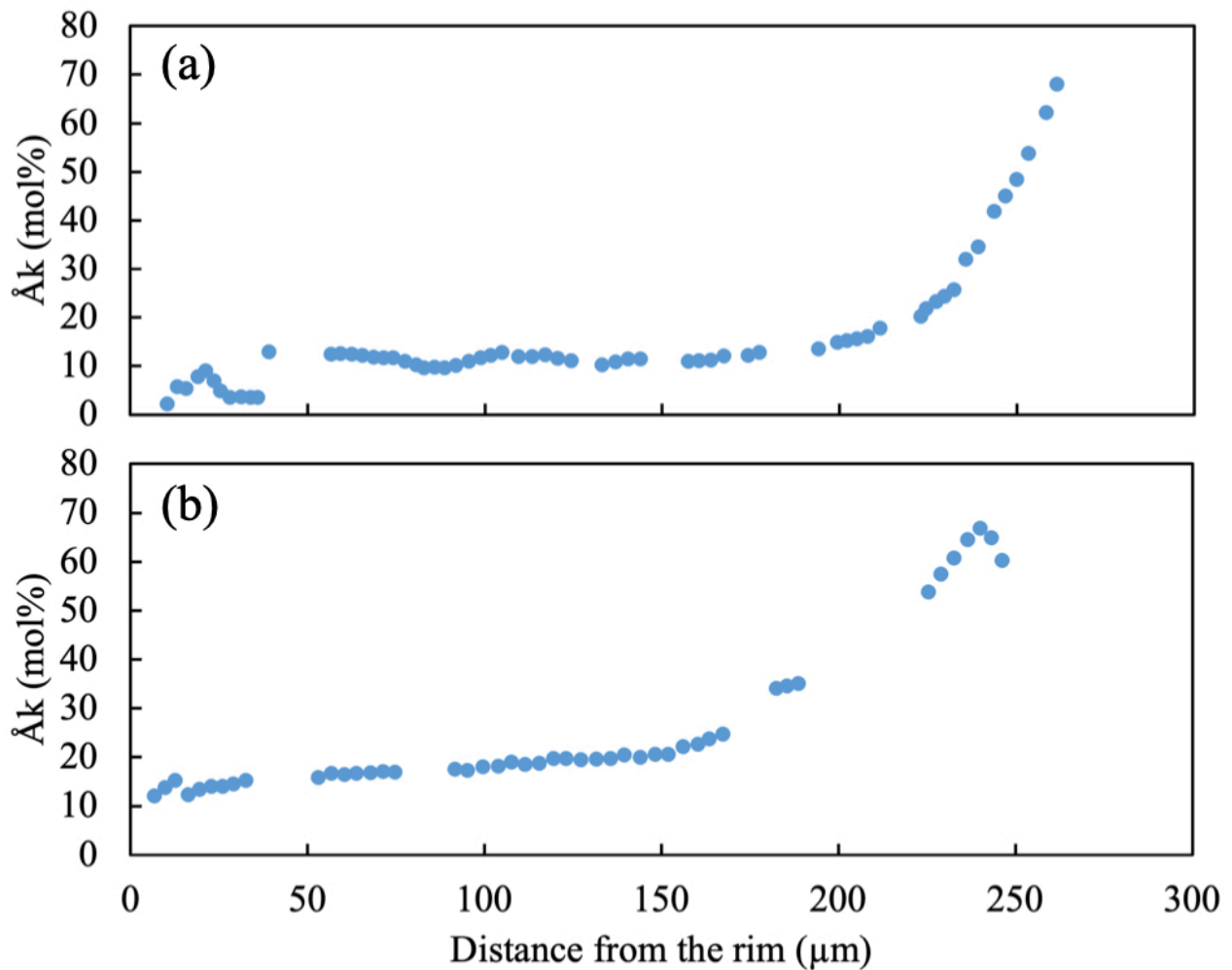


図1. メリライトマンタルの組成ゾーニング. 最高温度からの冷却過程のみ水素を導入した試料 (a) では, 組成がほぼ一定の部分が見られる一方, 昇温時から水素を導入した試料 (b) では, 試料中心に向かって緩やかにオケルマナイト (Åk) 成分の割合が上昇している.

Chondrule formation by collisions of planetesimals containing volatiles

*Sin-iti Sirono¹

1. Navoya Univ.

Keywords: chondrule, planetesimal, collision

Oral presentation

R5: Extraterrestrial materials

Chairperson: Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Toru Matsumoto (Kyoto University)

Sat. Sep 14, 2024 9:00 AM - 12:00 PM ES025 (Higashiyama Campus)

10:20 AM - 10:35 AM

[3Lecture-301-10-6add]休憩

Constraining the true timescale of chondrule formation through chondrule mineral chemistry

*Kohei Fukuda¹, Noriko T Kita², Makoto Kimura³

1. Osaka Univ. Sci., 2. UW-Madison, 3. NIPR

Keywords: chondrule, Al-Mg chronology, plagioclase, excess Si

Reproduction Experiments of Radial Pyroxene Chondrules Using a Gas-jet Levitation System under Reducing Conditions

*Kana Watanabe¹, Tomoki Nakamura¹, Tomoyo Morita¹

1. Tohoku Univ. Sci.

Keywords: chondrule, pyroxene, levitation experiment, partition coefficients, reduction reaction

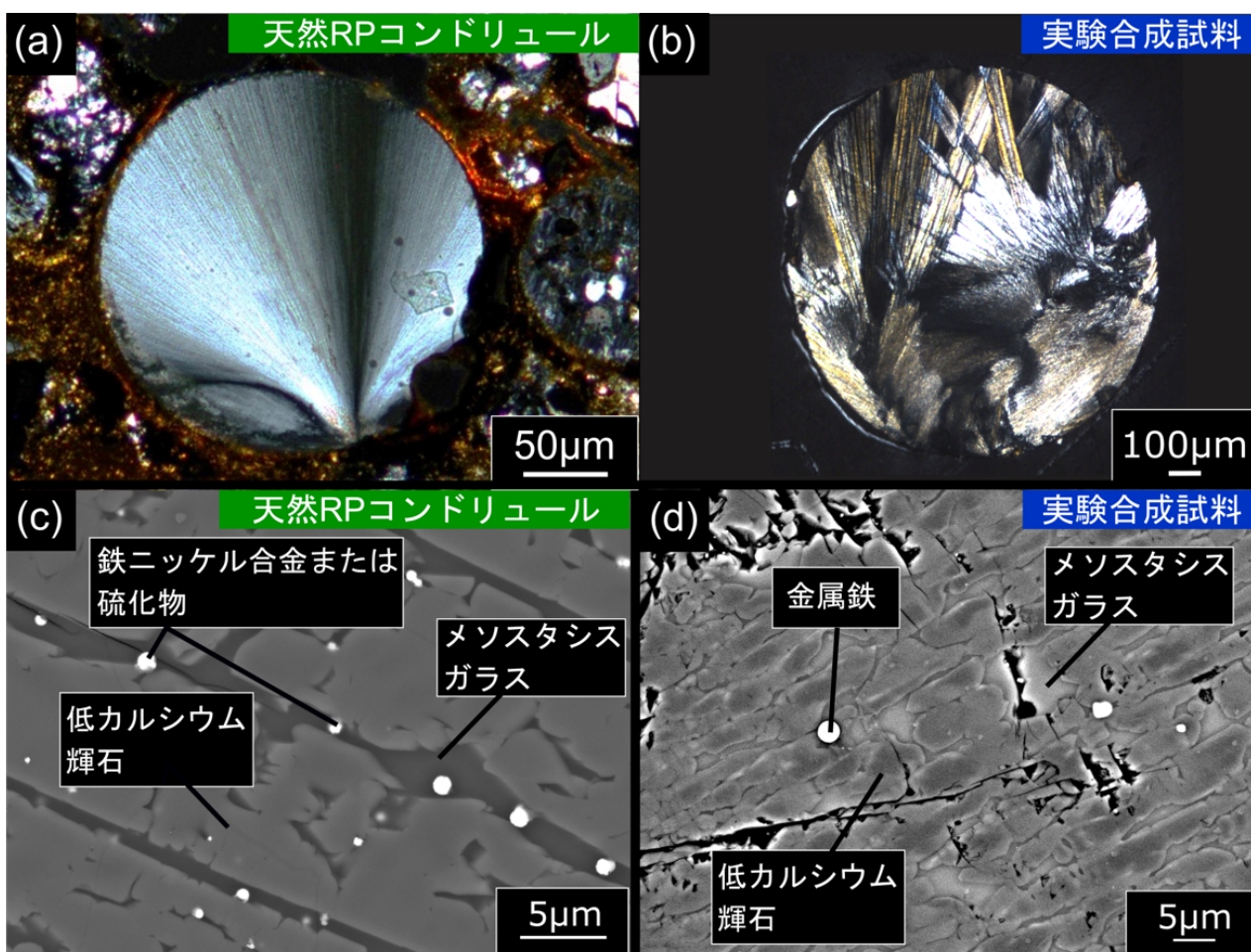


図1. 天然RPコンドリュールと実験合成試料の比較。(a)-(b)偏光顕微鏡による観察像(クロスニコル像)、(c)-(d)SEM-BSE像。(d)の実験合成試料は1536°Cで3600秒間温度保持した。

Stratigraphy of poikilitic shergottite parent body(ies) as deduced from their textural and mineral compositional diversities

*Sojiro Yamazaki¹, Akira Yamaguchi², Takashi Mikouchi³

1. Fac. Sci., Univ. Tokyo, 2. Natl. Inst. Polar Res., 3. Univ. Museum, Univ. Tokyo

Keywords: Poikilitic shergottite, Olivine, Pyroxene, Intrusion, Cooling rate

High pressure phase transition of Ti-Cr-rich spinel in Asuka 12325 Martian meteorite

*Atsushi TAKENOUCI¹, Yohei Igami², Takashi Mikouchi³, Akira Miyake², Akira Yamaguchi⁴

1. The Kyoto Univ. Museum, 2. Kyoto Univ. Sci., 3. The Univ. Museum, The Univ. of Tokyo, 4. NIPR

Keywords: Chromite, Martian meteorite, shock metamorphism, high-pressure phase transition

Estimation of thermal history using silica minerals in mesosiderites

*Haruka OONO¹, Atsushi Takenouchi², Takashi Mikouchi³, Akira Yamaguchi⁴, Naoji Sugiura⁵, Akira Miyake¹

1. Kyoto Univ., 2. Museum of Kyoto Univ., 3. Museum of Univ. Tokyo, 4. NiPR, 5. Chiba Int. Tech.

Keywords: Mesosiderite, Silica minerals, Tridymite, Cristobalite, Meteorites

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

📅 Sat. Sep 14, 2024 2:00 PM - 3:00 PM JST | Sat. Sep 14, 2024 5:00 AM - 6:00 AM UTC | 🏢 ES Hall
Higashiyama Campus

R6: Plutonic rocks, volcanic rocks and subduction factory

Chairperson: Takashi Hoshide (Akita University)

2:00 PM - 2:20 PM JST | 5:00 AM - 5:20 AM UTC

[R6-12] Zirconium minerals in ultramafic rocks

「招待講演」

*Hikaru Sawada^{1,2}, Ryosuke Oyanagi^{3,2} (1. University of Toyama, 2. JAMSTEC, 3. Kokushikan University)

2:20 PM - 2:35 PM JST | 5:20 AM - 5:35 AM UTC

[R6-13] Estimation of physical conditions during granitic magma crystallization process using melt inclusions in zircon

*Yuka TANIWAKI¹, Satoshi SAITO² (1. Ciatec., Co LTD, 2. Ehime Univ.)

2:35 PM - 2:50 PM JST | 5:35 AM - 5:50 AM UTC

[R6-14] Estimation of TiO_2 activity for accurate determination of quartz crystallization temperature

*Yasuhiro OGITA¹, Takenori Kato², Takashi Yuguchi³ (1. Yamagata Univ., 2. Nagoya Univ., 3. Kumamoto Univ.)

2:50 PM - 3:00 PM JST | 5:50 AM - 6:00 AM UTC

調整

Zirconium minerals in ultramafic rocks

*Hikaru Sawada^{1,2}, Ryosuke Oyanagi^{3,2}

1. University of Toyama, 2. JAMSTEC, 3. Kokushikan University

Keywords: Serpentinite, Peridotite, Zircon, Baddeleyite

Estimation of physical conditions during granitic magma crystallization process using melt inclusions in zircon

*Yuka TANIWAKI¹, Satoshi SAITO²

1. Ciatec.,Co LTD, 2. Ehime Univ.

Keywords: melt inclusion, granite, zircon, physical conditions

Estimation of TiO_2 activity for accurate determination of quartz crystallization temperature

*Yasuhiro OGITA¹, Takenori Kato², Takashi Yuguchi³

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

No abstract in English.

Keywords: Quartz, Cathodoluminescence pattern, Ti concentration, TiO_2 activity, Tono Plutonic Complex

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

📅 Sat. Sep 14, 2024 2:00 PM - 3:30 PM JST | Sat. Sep 14, 2024 5:00 AM - 6:30 AM UTC | 🏠 ES024
Higashiyama Campus

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

Chairperson: Kazuki 小松 Komatsu

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

[R2-12] Structural stabilization of pyrite-type compounds and chemical bonds of anions.

「招待講演」

*Akira YOSHIASA¹, Makoto Tokuda¹, Ginga Kitahara¹, Akihiko Nakatsuka², Kazumasa Sugiyama³ (1. Kumamoto University, 2. Yomaguchi University, 3. Tohoku University)

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

[R2-13] Formation of Fundamental Building Blocks Composed of Calcium Borate Minerals

「発表賞エントリー」

*Kosuke Yamaguchi¹, Atsushi Kyono², Satoru Okada¹, Hiroki Hasegawa¹ (1. Univ of Tsukuba. Grad. Sch. of Life and Env., Sci, 2. Univ of Tsukuba. Life and Environmental Science)

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

[R2-14] Crystal structures of kimuraite-(Y) and lokkaite-(Y)

*Ritsuro Miyawaki¹, Koichi Momma¹ (1. National Museum of Nature and Science)

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

[R2-15] Thermal Vibration of Oxygen atoms in Keatite Crystal

*Fumiya NORITAKE¹ (1. University of Yamanashi)

3:15 PM - 3:30 PM JST | 6:15 AM - 6:30 AM UTC

[R2-16] Development of a simulation method for electron back-scattered diffraction based on dynamical theory and its application to mineralogy

*Yusuke SETO¹, Masahiro Ohtsuka² (1. Osaka Metropolitan Univ. Sci., 2. Nagoya Univ. Sci. IMaSS.)

Structural stabilization of pyrite-type compounds and chemical bonds of anions.

*Akira YOSHIASA¹, Makoto Tokuda¹, Ginga Kitahara¹, Akihiko Nakatsuka², Kazumasa Sugiyama³

1. Kumamoto University, 2. Yamaguchi University, 3. Tohoku University

Precise structural analyses of various compounds with pyrite-type structure were performed by selecting single crystals from synthetic and natural mineral crystals. The measurements of Debye temperatures of the compounds will be reported as one of the usefulness of single crystal diffraction method. Certain regularities regarding structural stabilization and physical properties are found in pyrite-type compounds.

Keywords: AuSb₂, RuS₂, pyrite-type compounds, single crystal diffraction, Debye temperature

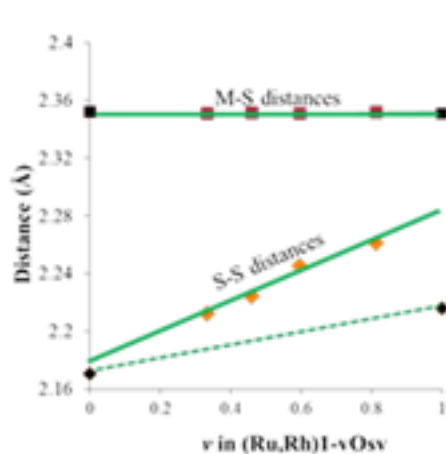


Fig. 1. Compositional dependences in M-S and S-S bonding distances with respect to Os content in the erlichmanite - laurite solid solutions ($(\text{Ru,Rh})_{1-y}\text{Os}_y\text{S}_2$) ($y=0.07-0.10$)[3].

Formation of Fundamental Building Blocks Composed of Calcium Borate Minerals

*Kosuke Yamaguchi¹, Atsushi Kyono², Satoru Okada¹, Hiroki Hasegawa¹

1. Univ of Tsukuba. Grad. Sch. of Life and Env., Sci, 2. Univ of Tsukuba. Life and Environmental Science

Keywords: hydrothermal method, dissolution-reprecipitation, gowerite, priceite, nobleite

Crystal structures of kimuraite-(Y) and lokkaite-(Y)

*Ritsuro Miyawaki¹, Koichi Momma¹

1. National Museum of Nature and Science

The crystal structures of kimuraite-(Y) and lokkaite-(Y) were re-examined by means of the twining and statistical ordering models with the space groups following to the individual extinction rules in their single crystal XRD data. The crystal structure of kimuraite-(Y) determined with the space group $I222$ is harmonic with that previously determined with the space group $I2cb$. The crystal structure of lokkaite-(Y) was analyzed with the monoclinic space group Cm to determine the mean structure in the $C222$. Each crystal structure of kimuraite-(Y) and lokkaite-(Y) consists of two types of layers: a flat calcium layer and a corrugated rare earth layer (Figure). The rare earth atoms are coordinated to 9 oxygen atoms. The 9-coordinated polyhedra are connected with the wedging triangle of carbonate anion to form the corrugated rare earth layer, as those in the crystal structure of tenerite-(Y). Calcium atoms statistically order into the Ca sites at the middle of the flat calcium layer. The C and O atoms neighboring to the Ca atoms should be shifted with the statistical occupancies. The crystal structures of kimuraite-(Y) and lokkaite-(Y) differ from each other in the sequence of stacking layers corresponding to the ratio of calcium and rare earths atoms.

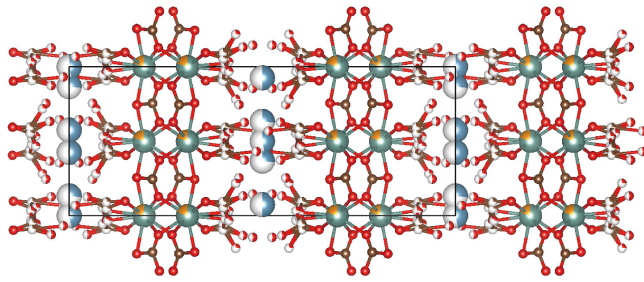
Keywords: kimuraite-(Y), lokkaite-(Y), crystal structure

Kimuraite-(Y)

$a = 9.2673(7)$

$b = 24.0435(2)$

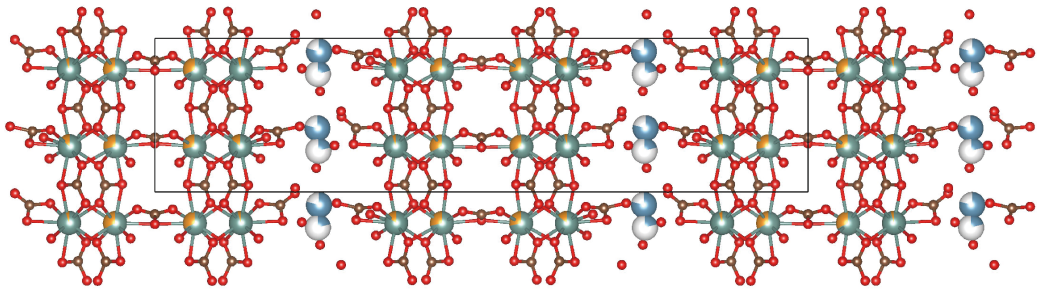
$c = 6.0537(2)$

**Lokkaite-(Y)**

$a = 9.242(4)$

$b = 39.328(18)$

$c = 6.110(2)$

**Tengerite-(Y)**

$a = 9.157(2)$

$b = 15.114(6)$

$c = 6.078(4)$

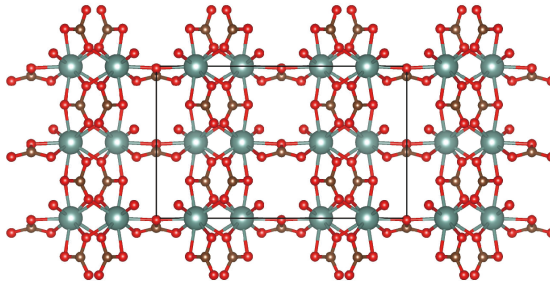


図 木村石、ロッカ石、テンゲル石の結晶構造

Thermal Vibration of Oxygen atoms in Keatite Crystal

*Fumiya NORITAKE¹

1. University of Yamanashi

Keywords: Keatite, Negative Thermal Expansion, Molecular Dynamics Simulation

Development of a simulation method for electron back-scattered diffraction based on dynamical theory and its application to mineralogy

*Yusuke SETO¹, Masahiro Ohtsuka²

1. Osaka Metropolitan Univ. Sci., 2. Nagoya Univ. Sci. IMaSS.

Keywords: Electron back-scattered diffraction, Bloch wave, Dynamical theory

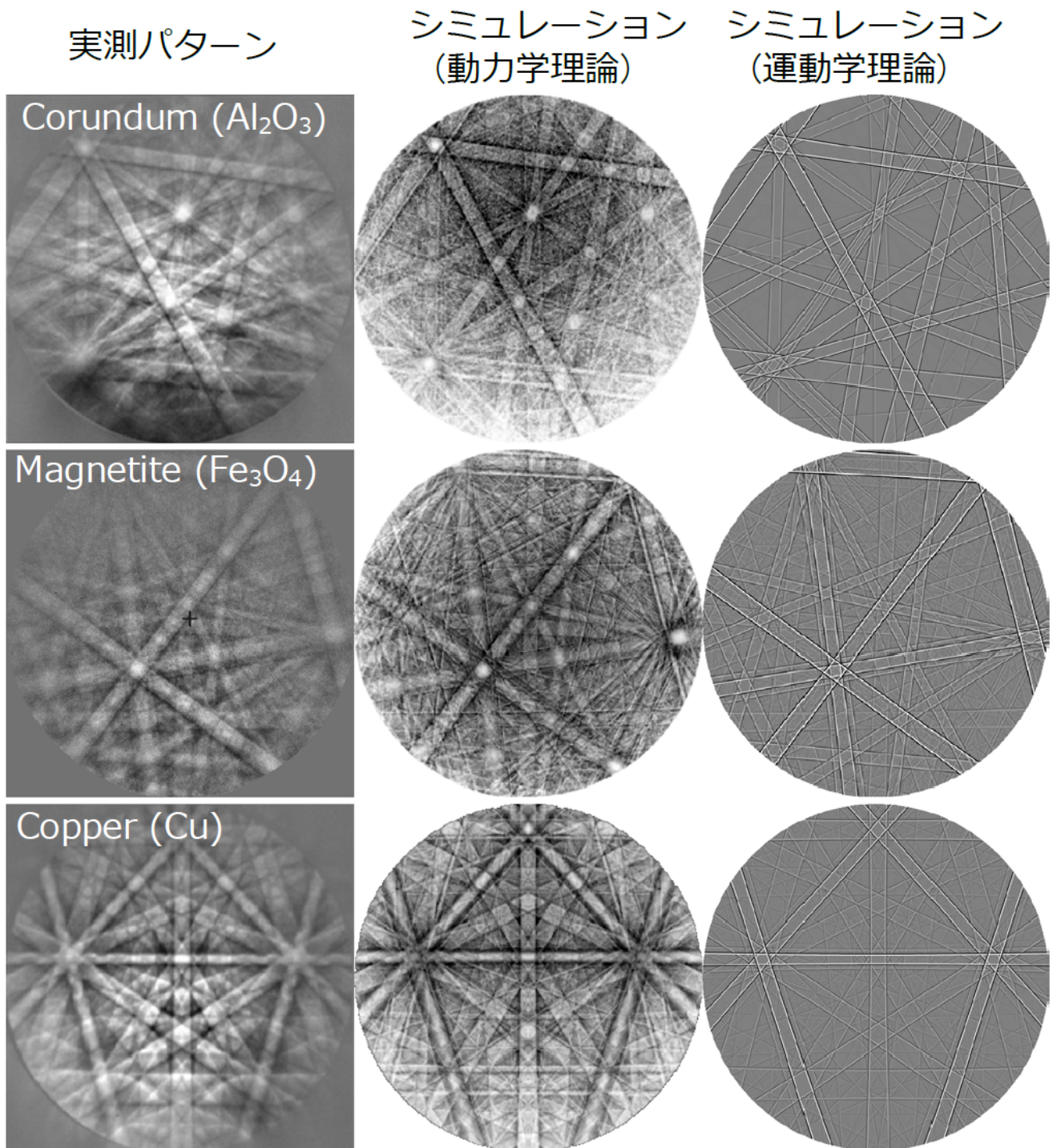


図. 実測のEBSDパターンと発表者らのシミュレーション結果との比較

Oral presentation | R5: Extraterrestrial materials

📅 Sat. Sep 14, 2024 2:00 PM - 3:30 PM JST | Sat. Sep 14, 2024 5:00 AM - 6:30 AM UTC | 🏠 ES025
Higashiyama Campus

R5: Extraterrestrial materials

Chairperson: Megumi Matsumoto, Daiki Yamamoto, Yusuke Seto, Toru Matsumoto (Kyoto University)

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

[R5-11] Mineralogy of micrometeoroids captured in silica aerogel aboard the ISS by the Dandelion Project

*Takaaki NOGUCHI¹, Akira MIYAKE¹, Hikaru Yabuta², Yoko Kebukawa³, Daiki Suga⁴, Makoto Tabata⁵, Kyoko Okudaira⁶, Akihiko Yamagishi⁷, Hajime Yano⁸ (1. Kyoto University, 2. Hiroshima University, 3. Tokyo Institute of Technology, 4. JASRI, 5. Chiba University, 6. University of Aizu, 7. Tokyo University of Pharmacy and Life Sciences, 8. JAXA)

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

[R5-12] STEM analysis of sodium-rich grains recovered from asteroid Ryugu

*Toru MATSUMOTO¹, Takaaki Noguchi¹, Toru Araki², Hayato Yuzawa², Akira Miyake¹ (1. Kyoto University, 2. UVSOR)

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

[R5-13] Important occurrence of amorphous hydrated Na-bearing Mg phosphate in Asteroid Ryugu samples and CI chondrites

*Takashi MIKOUCHI¹, Hideto Yoshida², Satoru Hayashi², Minami Masuda², Hiroyuki Kagi², Kazumasa Sugiyama³, Tomoki Nakamura⁴, Michael Zolensky⁵ (1. Univ. Museum, Univ. of Tokyo, 2. Fac. of Sci., Univ. of Tokyo, 3. Inst. Mat. Res., Tohoku Univ., 4. Fac. of Sci., Tohoku Univ., 5. NASA-JSC)

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

[R5-14] On the relationship between lithological classification and degree of aqueous alteration in Asteroid Ryugu samples

*Minami Masuda¹, Takashi Mikouchi², Hideto Yoshida¹, Tomoki Nakamura³, Michael Zolensky⁴ (1. Univ. Tokyo, Sci., 2. Univ. Tokyo, Univ. Museum, 3. Tohoku Univ., Sci., 4. NASA-JSC)

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

[R5-15] Highly primitive clasts with GEMS-like grains in Ryugu C0002 sample

*Megumi MATSUMOTO¹, Akira Tsuchiyama^{2,3}, Masahiro Yasutake⁴, Tomoki Nakamura¹ (1. Tohoku Univ., 2. Ritsumeikan Univ., 3. GIG, 4. JASRI/SPring-8)

3:15 PM - 3:30 PM JST | 6:15 AM - 6:30 AM UTC

[R5-16] Aqueous alteration experiments using GEMS simulant particles

*Akira TSUCHIYAMA^{1,2}, Satomi Enju³, Haiyang Xian¹, Mingqi Sun¹, Ding Xing¹, Yuanyuan Wang⁴, Zhaolu He¹, Jing Du¹, Shan Li¹, Jiabin Xi¹, Xiaojun Lin¹, Jian Di¹, Yuto Imura⁵ (1. Guangzhou Inst. Geochem., 2. Ritsumeikan Univ., 3. Ehime Univ. Sci., 4. Tokyo Univ. Sci., 5. Kyoto Univ. Sci.)

Mineralogy of micrometeoroids captured in silica aerogel aboard the ISS by the Dandelion Project

*Takaaki NOGUCHI¹, Akira MIYAKE¹, Hikaru Yabuta², Yoko Kebukawa³, Daiki Suga⁴, Makoto Tabata⁵, Kyoko Okudaira⁶, Akihiko Yamagishi⁷, Hajime Yano⁸

1. Kyoto University, 2. Hiroshima University, 3. Tokyo Institute of Technology, 4. JASRI, 5. Chiba University, 6. University of Aizu, 7. Tokyo University of Pharmacy and Life Sciences, 8. JAXA

Keywords: micrometeoroid, TANPOPO mission, International Space Station, pyroxene

STEM analysis of sodium-rich grains recovered from asteroid Ryugu

*Toru MATSUMOTO¹, Takaaki Noguchi¹, Toru Araki², Hayato Yuzawa², Akira Miyake¹

1. Kyoto University, 2. UVSOR

Keywords: Ryugu

Important occurrence of amorphous hydrated Na-bearing Mg phosphate in Asteroid Ryugu samples and CI chondrites

*Takashi MIKOUCHI¹, Hideto Yoshida², Satoru Hayashi², Minami Masuda², Hiroyuki Kagi², Kazumasa Sugiyama³, Tomoki Nakamura⁴, Michael Zolensky⁵

1. Univ. Museum, Univ. of Tokyo, 2. Fac. of Sci., Univ. of Tokyo, 3. Inst. Mat. Res., Tohoku Univ., 4. Fac. of Sci., Tohoku Univ., 5. NASA-JSC

Keywords: Mg phosphate, Asteroid Ryugu, CI chondrites, Aqueous alteration, Asteroid Bennu

On the relationship between lithological classification and degree of aqueous alteration in Asteroid Ryugu samples

*Minami Masuda¹, Takashi Mikouchi², Hideto Yoshida¹, Tomoki Nakamura³, Michael Zolensky⁴

1. Univ. Tokyo, Sci., 2. Univ. Tokyo, Univ. Museum, 3. Tohoku Univ., Sci., 4. NASA-JSC

Keywords: Asteroid Ryugu, CI chondrite, aqueous alteration, brecciation

Highly primitive clasts with GEMS-like grains in Ryugu C0002 sample

*Megumi MATSUMOTO¹, Akira Tsuchiyama^{2,3}, Masahiro Yasutake⁴, Tomoki Nakamura¹

1. Tohoku Univ., 2. Ritsumeikan Univ., 3. GIG, 4. JASRI/SPring-8

Keywords: asteroid (162173) Ryugu, GEMS, Aqueous alteration

Aqueous alteration experiments using GEMS simulant particles

*Akira TSUCHIYAMA^{1,2}, Satomi Enju³, Haiyang Xian¹, Mingqi Sun¹, Ding Xing¹, Yuanyuan Wang⁴, Zhaolu He¹, Jing Du¹, Shan Li¹, Jiaxin Xi¹, Xiaoju Lin¹, Jian Di¹, Yuto Imura⁵

1. Guangzhou Inst. Geochem., 2. Ritsumeikan Univ., 3. Ehime Univ. Sci, 4. Tokyo Univ. Sci., 5. Kyoto Univ. Sci.

Samples from the asteroid Ryugu by the Hayabusa2 spacecraft correspond to CI chondrites (e.g., [1]). In this study, to reproduce the initial stages of aqueous alteration of Ryugu parent body [2], we performed an aqueous alteration experiment using GEMS simulant particles, prepared by the induction thermal plasma (ITP) [3] with CI or GEMS average composition. Aqueous solutions of formic acid, hexamethylenetetramine, ammonium acetate, and/or ammonium hydrogen carbonate were heated at 200°C for 168~1550 hours in a sealed Teflon container with the GEMS simulant with the rock/water ratio of 5 (or 1). Run products were analyzed by XRD, SEM/EDS, TEM/EELS, and micro-Raman spectroscopy. In all runs, low-crystallinity hydrous layered silicates (Mg silicate hydrate: M-S-H) were formed. Hematite, maghemite or magnetite + hematite formed as Fe oxides consisted of fine particles (~a few 10 nm) and occasionally dendrites within a M-S-H matrix (Fig. 1a). The run products may represent the very early state of aqueous alteration. In most runs, small amounts of anhydrite were formed, but no carbonate formed. Organic crystals and ammonium sulfates also formed. IOM with G and D bands were confirmed by Raman spectroscopy. The run products are aggregates of several 10 μm sized clasts with different porosities (Fig. 1b), which reflects the original texture of the starting material. Ryugu sample matrix of similar texture [2] may be inherited from that formed by accumulation in the parent body. The present experiment was not fully successful in reproducing the minerals and their morphologies as seen in the Ryugu samples. In particular, the formation of maghemite and anhydrite indicates that further experiments under more reducing conditions are necessary. [1] Nakamura T. et al. (2023) *Science*, 379, eabn867. [2] Tsuchiyama A. et al. (2024) *GCA*, 375, 146-172. [3] Enju S. et al. (2022) *A&A*, 661, A121.

Keywords: Ryugu samples, Mg-S-H, carbonaceous chondrites, GEMS-like material, induction thermal plasma

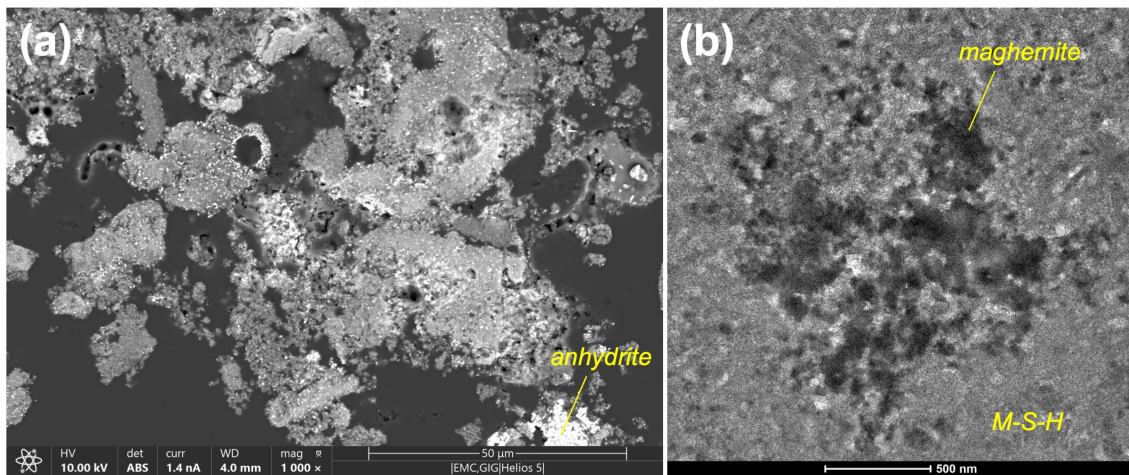


Figure 1. (a) SEM/BSE image of Run 11 (Cl composition, water + NH_4HCO_3 : $X(\text{CO}_2)/X(\text{H}_2\text{O})=0.0317$, $X(\text{NH}_3)/X(\text{H}_2\text{O})=0.0317$, $W/R=5$, 200°C , 1550 hrs.). Different brightness of matrix roughly corresponds to different porosity. (b) TEM/bright field image of Run 07 (Cl composition, water + CH_2O_2 : $X(\text{CO}_2)/X(\text{H}_2\text{O})=0.0435$, $X(\text{NH}_3)/X(\text{H}_2\text{O})=0$, $W/R=5$, 200°C , 168 hrs.) showing a dendritic aggregate of maghemite.