

CV of Shoji Arai



PERSONAL INFORMATION

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Date of Birth: OCTOBER 27, 1948

Position: PROFESSOR OF EARTH SCIENCES, KANAZAWA UNIVERSITY

EDUCATION

B.S. in Geology, University of Tokyo, Tokyo, Japan: March 1971.

M.S. in Geology, University of Tokyo, Tokyo, Japan: March 1973.

DSc. in Geology, University of Tokyo, Tokyo, Japan: March 1976.

EMPLOYMENT HISTORY

April 1976-March 1977: Research Associate, University of Tokyo, Japan

April 1977-April 1979: Research Associate, Shizuoka University, Japan

May 1979-March 1981: Associate Professor, Shizuoka University, Japan

April 1981-November 1985: Associate Professor, University of Tsukuba, Japan

December 1985-March 1989: Assistant Professor, University of Tsukuba, Japan

April 1989-March 2014: Professor, Kanazawa University, Japan

April 2014-present: Professor (specially appointed), Kanazawa University, Japan

SOCIAL ACITIVITY

Member of IODP Planning Committee of Japan (2002-2005)

Member of IODP Science Planning Committee of Japan (2003-2006)

Chairman of Committee of Earth's Interior of Japanese Drilling Earth Science Consortium (2003-2006)

Co-chair of Science Steering and Evaluation Panel of IODP (2003-2005)

President of Japanese Association for Petrologists, Mineralogists and Economic Geologists (2002-2004)

Member of the Science Council of Japan (2012-present)

SOCIAL ACITIVITY

Young Researcher Award of the Japanese Association for Petrologists, Mineralogists and Economic Geologists (January 1976)

Award of the Japan Association of Mineralogical Sciences (September 2009)

RESEARCH INTEREST (SEE THE PUBLICATION LIST)

I have been working on petrology of deep-seated rocks (mainly peridotite and related rocks) from the ocean floor, the island arc and continent. I have also been interested in the geological aspects of emplacement of mantle materials.

List of Publication (articles in English)

1. Fukushi, K., Sakai, H., Itono, T., Tamura, A. and Arai, S. (2014) Desorption of intrinsic cesium from smectite: Inhibitive effects of clay particle organization on cesium desorption. *Environmental Science & Technology* (in press)
2. Shafaii Moghadam, H., Li, X.-H., Ling, X.-X., Stern, R.J., Khedr, M.Z., Chiaradia, M., Ghorbani, G., Arai, S. and Tamura, A. (2014) Devonian to Permian evolution of the Paleotethys Ocean: New evidence from U–Pb zircon dating and Sr–Nd–Pb isotopes of the Darrehanjir–Mashhad “ophiolites”, NE Iran. *Gondwana Research* (in press)
3. Torabi, Ghodrat, Arai, Shoji and Abbasi, Hamideh (2014) Eocene continental dyke swarm from central Iran (Khur area). *Petrology*, 22 (in press)
4. Akizawa, N. and Arai, S. (2014) Petrology of mantle diopsidite from Wadi Fizh, northern Oman ophiolite: Cr and REE mobility by hydrothermal solution. *Island Arc* (in press)
5. Shafaii Moghadam, H., Khedr, M.Z., Arai, S., Stern, R.J., Ghorbani, G., Tamura, A. and Ottley, C.J. (2014) Arc-related harzburgite-dunite-chromitite complexes in the mantle section of the Sabzevar ophiolite, Iran: a model for formation of podiform chromitites. *Gondwana Research* (in press)
6. Moghadam, H. Shafaii, Ghorbani, G., Khedr, M. Zaki, Fazlnia, N., Chiaradia, M., Eyuboglu, Y., Santosh, M., Francisco, C. Galindo, Martinez, M. Lopez, Gourgaud, A., Arai, S. (2014) Late Miocene K-rich volcanism in the Eslamieh Peninsula (Saray), NW Iran: Implications for geodynamic evolution of the Turkish-Iranian High Plateau. *Gondwana Research*, 26, 1028-1050.
7. Desta, M.T., Ayalew, D., Ishiwatari, A., Arai, S. and Tamura, A. (2014) Ferropicrite from the Lalibela area in the Ethiopian large igneous province. *Journal of Mineralogical and Petrological Sciences*, 109, 191-207.
8. Moghadam, H.S., Khedr, M.Z., Chiaradia, M., Stern, R.J., Bakhshinzad, F., Arai, S. Ottley, C.J. and Tamura, S. (2014) Supra-subduction zone magmatism of the Neyriz ophiolite, Iran: constraints from geochemistry and Sr-Nd-Pb isotopes. *International Geology Review*, 56, 1395-1412.
9. Payot, B. D., Arai, S., Dick, H.J.B., Abe, N. and Ichiyama, Y. (2014) Podiform chromitite formation in a low-Cr/high-Al system: An example from the Southwest Indian Ridge (SWIR). *Mineralogy and Petrology*, 108, 533-549.

10. Shirdashtzadeh, N., Torabi, G., Meisel, T., Arai, S., Bokhari, S.N.H., Samadi, R. and Gazel, E. (2014) Origin and evolution of metamorphosed mantle peridotites of Darreh Deh (Nain Ophiolite, Central Iran): Implications for the Eastern Neo-Tethys evolution. *Neues Jahrbuch für Geologie und Paläontologie Abhandlungen*, 273, 89-120.
11. Mizukami, T., Yokoyama, H., Hiramatsu, Y., Arai, S., Kawahara, H., Nogaya, T. and Wallis, S.R. (2014) Two types of antigorite serpentinite controlling heterogeneous slow-slip behaviours of slab-mantle interface. *Earth and Planetary Science Letters*, 401, 148-158.
12. Ismail, S.A., Kettanah, Y.A., Chalabi, S.N., Ahmed, A.H. and Arai, S. (2014) Petrogenesis and PGE distribution in the Al- and Cr-rich chromitites of the Qalander Ophiolite, northeastern Iraq: Implications for the tectonic environment of the Iraqi Zagros Suture Thrust Zone. *Lithos*, 202-203, 21-36
13. Rajabi, S., Torabi, G. and Arai, S. (2014) Oligocene crustal xenolith-bearing alkaline basalt from Jandaq area (Central Iran): Implications for magma genesis and crustal nature, Island Arc, 23, 125-141.
14. Takeuchi, M. and Arai, S. (2014) Lower crustal metasomatism inferred from mafic xenoliths from Ichinomegata crater, Northeast Japan arc. *Journal of Mineralogical and Petrological Sciences*, 109, 85-90.
15. Muroi, R. and Arai, S. (2014) Formation process of olivine-clinopyroxene cumulates inferred from Takashima xenoliths, Southwest Japan arc. *Journal of Mineralogical and Petrological Sciences*, 109, 79-84.
16. Helmy, H.M., Abd El-Rahma, Y.M., Yushikawa, M., Shibata, T., Arai, S., Tamura, A. and Kagami, H. (2014) Petrology and Sm-Nd dating of the Genina Gharbia Alaskan-type complex (Egypt): Insights into deep levels of Neoproterozoic island arcs. *Lithos*, 198-199, 263-280.
17. Ghosh, B., Morishita, T., Gupta, B.S., Tamura, A., Arai, S. and Bandyopadhyay, D. (2014) Moho Transition Zone in the Cretaceous Andaman ophiolite, India: a passage from the mantle to the crust. *Lithos*, 198-199, 117-128.
18. Tamura, A., Morishita, T., Ishimaru, S. and Arai, S. (2014) Geochemistry of spinel-hosted amphibole inclusions in abyssal peridotite: insight into secondary melt formation in melt-peridotite reaction. *Contributions to Mineralogy and Petrology*, 167, 974, DOI 10.1007/s00410-014-0974-x
19. Pirnia, T., Arai, S., Tamura, A., Ishimaru, S. and Torabi, G. (2014) Sr enrichment in mantle pyroxenes as a result of plagioclase alteration in lherzolite. *Lithos*, 196-197, 198-212.
20. Miura, M., Arai, S. and Tamura, A. (2014) Formation of discordant chromitite as the initiation of sub-arc mantle process: Observations from northern Oman ophiolite. *Journal of Mineralogical and Petrological Sciences*, 109, 38-43.

21. González-Jiménez, J.-M., Griffin, W.L., Proenza, J.A., Gervilla, F., O'Reilly, S.Y., Akbulut, M., Pearson, N.J. and Arai, S. (2014) Chromitites in ophiolites: how, where, when, why?, Part II. A review and new ideas on the crystallization of chromitites. *Lithos*, 189, 140-158.
22. Khedr, M.Z., Arai, S., Tamura, A. and Python, M. (2014) Chemical variations of abyssal peridotites in the central Oman ophiolite: evidence of oceanic mantle heterogeneity. *Gondwana Research*, 25, 1242-1262.
23. Nosouhian, N., Torabi, G. and Arai, S. (2014) Metapicrites of the Bayazeh ophiolite (Central Iran), a trace of Paleo-Tethys subduction-related mantle metasomatism. *Neues Jahrbuch für Geologie und Paläontologie Abhandlungen*, 271, 1-19.
24. Arai, S. and Akizawa, N. (2014) Precipitation and dissolution of chromite by hydrothermal solutions in the Oman ophiolite: new behavior of Cr and chromite. *American Mineralogist*, 99, 28-34.
25. Erdenesaihan, G., Ishiwatari, A., Orolmaa, D., Arai S. and Tamura, A. (2013) Middle Paleozoic greenstones of the Hangay region, central Mongolia: Remnants of an accreted oceanic plateau and forearc magmatism. *Journal of Mineralogical and Petrological Sciences*, 108, 305-325.
26. Nojiri, H., Okuno, M., Okudera, H., Mizukami, T. and Arai, S. (2013) Structural change of alkali feldspar by ball milling. *Journal of Mineralogical and Petrological Sciences*, 108, 267-277.
27. Fukushi, K., Hasegawa, Y., Maeda, K., Aoi, Y., Tamura, A., Arai, S., Yamamoto, Y., Aosai, D. and Mizuno, T. (2013) Sorption of Eu (III) on granite: EPMA, La-ICP-MS, batch and modeling studies. *Environmental Science & Technology*, 47, 12811-12818.
28. Pirnia T., Arai, S. and Torabi, G. (2013) A better picture of the mantle section of the Nain ophiolite inferred from detrital chromian spinel. *Journal of Geology*, 121, 645-661.
29. Ito, H., Tamura, A., Morishita, T., Arai, S., Arai, F. and Kato, O. (2013) Quaternary plutonic magma activities in the southern Hachimantai geothermal area (Japan) inferred from zircon LA-ICP-MS U-Th-Pb dating method. *Journal of Volcanology and Geothermal Research*, 265, 1-8.
30. Arasuna, A., Okuno, M., Okudera, H., Mizukami, T., Arai, S., Katayama, S., Koyano, M. and Ito, N. (2013) Structural changes of synthetic opal by heat treatment. *Physics and Chemistry of Minerals*, 40, 747-755.
31. Khedr, M.Z. and Arai, S. (2013) Origin of Neoproterozoic ophiolitic peridotites in south Eastern Desert, Egypt, constrained from primary mantle mineral chemistry. *Mineralogy and Petrology*, 107, 807-828.
32. Hasebe, N., Tamura, A. and Arai, S. (2013) Zeta equivalent fission-track dating using LA-ICP-MS and examples with simultaneous U-Pb dating. *Island Arc*, 22, 280-291.

33. Ali, M. and Arai, S. (2013) Cr-rich magnesiokatophorite as an indicator of mantle metasomatism by hydrous Na-rich carbonatite. *Journal of Mineralogical and Petrological Sciences*, 108, 215-226.
34. Arai, S. (2013) Conversion of low-pressure chromitites to ultrahigh-pressure chromitites by deep recycling: A good inference. *Earth and Planetary Science Letters*, 379, 81-87.
35. Ichiyama, Y., Morishita, T., Tamura, A. and Arai, S. (2013) Petrology of peridotite xenolith-bearing basaltic to andesitic lavas from the Shiribeshi Seamount, off northwestern Hokkaido, Japan Sea: Mixing of near-primary basaltic and crustal felsic magmas in a rear-arc volcano. *Journal of Asian Earth Sciences*, 76, 48-58.
36. Payot, B.D., Arai, S., Tamayo, R.A., Jr. and Yumul, G.P., Jr. (2013) Textural evidence for the chromite-oversaturated character of the melt involved in podiform chromitite formation. *Resource Geology*, 63, 313-319.
37. Torabi, G. and Arai, S. (2013) Back-arc Paleo-Tethys related blueschist from Central Iran, South of Chupannan, Isfahan Province. *Petrology*, 21, 393-407.
38. Hirano, N., Machida, S., Abe, N., Morishita, T., Tamura, A. and Arai, S. (2013) Petit-spot lava fields off the central Chile Trench induced by plate flexure. *Geochemical Journal*, 47, 249-257
39. Negishi, H., Arai, S., Yurimoto, H., Ito, S., Ishimaru, S., Tamura, A and Akizawa, N. (2013) Sulfide-rich dunite within a thick Moho transition zone of the northern Oman ophiolite: implications for the origin of Cyprus-type sulfide deposits. *Lithos*, 164-167, 22-35.
40. Khedr, M.Z., Arai, S. and Python, M. (2013) Petrology and chemistry of basal lherzolites above the metamorphic sole from Wadi Sarami, central Oman ophiolite. *Journal of Mineralogical and Petrological Sciences*, 108, 13-24.
41. Abbou-Kebir, K., Arai, S., Ahmed, A.H. and Ceuleneer, G. (2013) Spinel-free and spinel-poor dunite veins crosscutting the Wadi Rajmi ophiolite chromitite (northern Oman ophiolite). *Bulletin de la Société Géologique de France* 184, 259-264.
42. Rajesh, V.J., Arai, S., Satish-Kumar, M., Santosh, M. and Tamura, A. (2013) High-Mg low-Ni olivine cumulates from a Pan-African accretionary belt in southern India: Implications for the genesis of volatile-rich high-Mg melts in suprasubduction setting. *Precambrian Research*, 227, 409-425.
43. Ito, H., Yamada, R., Tamura, A., Arai, S., Horie, K. and Hokada, T. (2013) Earth's youngest exposed granite and its tectonic implications: the 10-0.8 Ma Kurobegawa Granite. *Nature, Scientific Reports*, 3:1306, DOI:10.1038/srep01306.
44. Abd El-Rahman, Y., Helmy, H.M., Shibata, T., Yoshikawa, M., Arai, S. and Tamura, A. (2012) Mineral chemistry of the Neoproterozoic Alaskan-type Akarem Intrusion with special emphasis on amphibole: Implications for the pluton origin and evolution of

- subduction-related magma. *Lithos*, 155, 410-425.
45. Borisova, A., Ceuleneer, G., Kamenetsky, V., Arai, S., Bějina, F., Bindeman, I., Polvé, M., de Parseval, P., Aigouy, T. and Pokrovski, G. (2012) A new view on the petrogenesis of the Oman ophiolite chromitites from microanalyses of chromite-hosted inclusions. *Journal of Petrology*, 53, 2411-2440.
 46. Miura, M., Arai, S., Ahmed, A.H., Mizukami, M., Okuno, M. and Yamamoto, S. (2012) Podiform chromitite classification revisited: a comparison of discordant and concordant chromitite pods from Wadi Hilti, northern Oman ophiolite. *Journal of Asian Earth Sciences* 59, 52-61.
 47. Akizawa, N., Arai, S. and Tamura, A. (2012) Behavior of MORB magmas at uppermost mantle beneath a fast-spreading axis: an example from Wadi Fizh of the northern Oman ophiolite. *Contributions to Mineralogy and Petrology*, 164, 601-625.
 48. Arai, S., Ishimaru, S. and Mizukami, T. (2012) Methane and propane micro-inclusions in olivine in titanoclinohumite-bearing dunites from the Sanbagawa high-P metamorphic belt, Japan: hydrocarbon activity in a subduction zone and Ti mobility. *Earth and Planetary Science Letters*, 353-354, 1-11.
 49. Yang, K., Szabó, Cs. and Arai, S. (2012) Silica enrichment on Group II xenoliths by evolved alkali basalt from Jeju Island, South Korea: implication for modification of intraplate deep-seated rocks. *Mineralogy and Petrology*, 106, 107-130.
 50. Kobayashi, T., Yamamoto, J., Hirajima, T., Ishibashi, H., Hirano, N., Kai, Y., Prikhod'ko, V.S. and Arai, S. (2012) Conformity and precision of CO₂ densimetry in CO₂ inclusions: microthermometry *versus* Raman microspectroscopic densimetry. *Journal of Raman Spectroscopy*, 43, 1126-1133.
 51. Spengler, D., Obata, M., Hirajima, T., Ottolini, L., Ohfuji, H., Tamura, A. and Arai, S. (2012) Exsolution of garnet and clinopyroxene from high-Al pyroxenes in Xugou peridotite, E China. *Journal of Petrology*, 53, 1477-1504.
 52. Yamamoto, J., Nishimura, K., Ishibashi, H., Kagi, H., Arai, S. and Prikhod'ko, V.S. (2012) Thermal structure beneath Far Eastern Russia inferred from geothermobarometric analyses of mantle xenoliths: direct evidence for high geothermal gradient in backarc lithosphere. *Tectonophysics*, 554-557, 74-82.
 53. Ishimaru, S. and Arai, S. (2012) Possibility of titanium transportation within a mantle wedge: formation process of titanoclinohumite in Fujiwara dunite in Sanbagawa belt, Japan. *Solid Earth Discuss.*, 4, 230-239. www.solid-earth-discuss.net/4/203/2012/ doi:10.5194/sed-4-203-2012
 54. Yang, K., Arai, S., Yu, J-E., Yun, S-H. and Hwang, J-Y. (2012) Gabbroic xenoliths and megacrysts in Pleisto-Holocene alkali basalts from Jeju Island, South Korea: implications for metasomatism of the lower continental crust. *Lithos* 142/143, 201-215.

55. Ahmed, A.H., Gharib, M.E. and Arai, S. (2012) Characterization of the thermally metamorphosed mantle-crust transition zone of the Neoproterozoic ophiolite at Gebel Mudarjaj, South Eastern Desert, Egypt. *Lithos* 142/143, 67-83.
56. Sueoka, S., Kohn, B.P., Tagami, T., Tsutsumi, H., Hasebe, N., Tamura, A. and Arai, S. (2012) Denudation history of the Kiso Range, central Japan, and its tectonic implications: Constraints from low-temperature thermochronology. *Island Arc*, 21, 32-52.
57. Gahlan, H.A., Arai, S., Abu El-Ela, F.F. and Tamura, A. (2012) Origin of wehrlite cumulates in the Moho Transition Zone of the Neoproterozoic Ras Salait Ophiolite, Central Eastern Desert, Egypt. *Contributions to Mineralogy and Petrology*, 163, 225-241.
58. Khedr, M.Z. and Arai, S. (2012) Petrology and geochemistry of prograde deserpentinized peridotites from Happo-O'ne, Japan: evidence of element mobility during deserpentinization. *Journal of Asian Earth Sciences*, 43, 150-163.
59. Hasebe, N., Aratake, K., Tamura, A., Okuno, M., Arai, S. and Shinno, I. (2011) Raman spectroscopy of synthetic zircon: Effects of chemical composition. *The Science Reports of Kanazawa University*, 55, 17-24.
60. Shirdashtzadeh, N., Torabi, G. and Arai, S. (2011) Two Mesozoic oceanic phases recorded in the basic and metabasic rocks of the Nain and Ashin-Zavar ophiolitic mélanges (Isfahan Province, central Iran). *Ophiolite*, 36, 191-205.
61. Akizawa, N., Arai, S., Tamura, A., Uesugi, J. and Python, M. (2011) Crustal diopsidites from the northern Oman ophiolite: evidence for hydrothermal circulation through suboceanic Miho. *Journal of Mineralogical and Petrological Sciences*, 106, 261-266.
62. Abbou-Kebir, K., Arai, S., Ahmed, A.H. and Ceuleneer, G. (2011) Origin of spinel-free dunite veins from northern Oman ophiolite: Possible involvement of a komatiitic melt. *Journal of Mineralogical and Petrological Sciences*, 106, 235-245.
63. Khedr, M.Z. and Arai, S. (2011) Petrology and geochemistry of chromian spinel-bearing serpentinites in the Hida Marginal Belt (Ise area, Japan): characteristics of their protoliths. *Journal of Mineralogical and Petrological Sciences*, 106, 255-260.
64. Torabi, G., Shirdashtzadeh, N., Arai, S. and Koepke, J. (2011) Paleozoic and Mesozoic ophiolites of Central Iran: amphibolites from Jandaq, Posht-e-Badam, Nain and Ashin ophiolites. *Neues Jahrbuch für Geologie und Paläontologie Abhandlungen*, 262, 227-240.
65. Torabi, G., Arai, S. and Koepke, J. (2011) Metamorphosed mantle peridotites from Central Iran (Jandaq area, Isfahan province). *Neues Jahrbuch für Geologie und Paläontologie Abhandlungen*, 261, 129-150.
66. Payot, B.D., Arai, S. and Tamayo, R.A., Jr. (2011) Abyssal harzburgite veined by silica-oversaturated melt in the Sibuyan Ultramafics, Romblan, Central Philippines. *Journal of Mineralogical and Petrological Sciences*, 106, 175-180.
67. Morishita, T., Dilek, Y., Shallo, M., Tamura, A. and Arai, S. (2011) Insight into the

- uppermost mantle section of a maturing arc: The Eastern Mirdita ophiolite, Albania. *Lithos*, 124, 215-226.
68. Python, M., Yoshikawa, M., Shibata, T. and Arai, S. (2011) Diopsidites and rodingites: serpentinization and Ca-metasomatism in the Oman ophiolite mantle. In R.K. Srivastava (ed.) *Dyke Swarms: Keys for Geodynamic Interpretation*. Springer-Verlag, Berlin, pp. 401-435.
 69. Arai, S. and Ishimaru, S. (2011) Zincian chromite inclusions in diamond: a possible deep recycling origin. *Journal of Mineralogical and Petrological Sciences*, 106, 85-90.
 70. Miura, M., Arai, S. and Mizukami, T. (2011) Raman spectroscopy of hydrous inclusions in olivine and orthopyroxene in ophiolitic harzburgite: implications for elementary processes in serpentinization. *Journal of Mineralogical and Petrological Sciences*, 106, 91-96.
 71. Ishimaru, S. and Arai, S. (2011) Peculiar Ca-Mg-Si metasomatism along a shear zone within the mantle wedge: inference from fine-grained xenoliths from Avacha volcano, Kamchatka. *Contributions to Mineralogy and Petrology*, 161, 703-720.
 72. Arai, S., Okamura, H., Kadoshima, K., Tanaka, C., Suzuki, K. and Ishimaru, S. (2011) Chemical characteristics of chromian spinel in plutonic rocks: implications for deep magma processes and discrimination of tectonic setting. *Island Arc*, 20, 125-137.
 73. Yoshikawa, M., Arai, S., Ishida, Y., Tamura, A. and Shimizu, Y. (2010) Geochemical and Sr-Nd features of ultramafic xenoliths from Kurose, the Southwest Japan. *Journal of Mineralogical and Petrological Sciences*, 105, 346-351.
 74. Arai, S. (2010) Possible recycled origin for ultrahigh-pressure chromitites in ophiolites. *Journal of Mineralogical and Petrological Sciences*, 105, 280-285.
 75. Khedr, M. Z., Arai, S., Tamura, A. and Morishita, T. (2010) Clinopyroxenes in high-P metaperidotites from Happono, central Japan: implication for wedge-transversal chemical change of slab-derived fluids. *Lithos*, 119 439-456.
 76. Santosh, M., Rajesh, V. J., Tsunogae, T. and Arai, S. (2010) Diopsidites from a Neoproterozoic-Cambrian suture in southern India. *Geological Magazine*, 147, 777-788.
 77. Akbulut, M., Pişkin, Ö., Arai, S., Özgenç, İ and Minareci, F. (2010) Base Metal (BM) and Platinum-Group Element (PGE) Mineralogy and geochemistry of Elmaslar Chromite Deposit (Denizli, SW Turkey): Implications for a local BM and PGE enrichment. *Ofioliti*, 35, 1-20.
 78. Pirnia, T., Arai, S. and Torabi, G. (2010) Post-deformational impregnation of depleted MORB in Nain Iherzolite (Central Iran). *Journal of Mineralogical and Petrological Sciences*, 105, 74-79.
 79. Rajesh, V. J., Arai, S., Santosh, M. and Tamura, A. (2010) LREE-rich hibonite in ultrapotassic rocks in southern India. *Lithos*, 115, 40-50.
 80. Khedr, M.Z. and Arai, S. (2010) Hydrous peridotites with Ti-rich chromian spinel as a

- low-temperature forearc mantle facies; evidence from the Happo-O'ne metaperidotites (Japan). *Contributions to Mineralogy and Petrology*, 159, 137-157.
81. Shirdashtzadeh, N., Torabi, G. and Arai, S. (2010) Metamorphism and metasomatism in the Jurassic Nain ophiolitic mélangé, Central Iran. *Neues Jahrbuch für Geologie und Paläontologie Abhandlungen*, 255, 255-275.
 82. Morishita, T., Hara, K., Nakamura, K., Sawaguchi, T., Tamura, A., Arai, S., Okino, K., Takai, K. and Kuragai, H. (2009) Igneous, alteration and exhumation processes recorded in abyssal peridotites and related fault rocks from an oceanic core complex along the Central Indian Ridge. *Journal of Petrology*, 50, 1299-1325.
 83. Rajesh, V.J., Arai, S. and Satish-Kumar, M. (2009) Origin of graphite in glimmerite and spinellite in Achankovil Shear Zone, southern India. *Journal of Mineralogical and Petrological Sciences*, 104, 407-412.
 84. Akizawa, N. and Arai, S. (2009) Petrologic profile of peridotite layers under a possible Moho in the northern Oman ophiolite: an example from Wadi Fizh. *Journal of Mineralogical and Petrological Sciences*, 104, 389-394.
 85. Payot, B. D., Arai, S., Tamura, A., Ishimaru, S. and Tamayo, R.A., Jr. (2009) Unusual ultra-depleted dunite from Sibuyan Island (the Philippines): a residue for ultra-depleted MORB? *Journal of Mineralogical and Petrological Sciences*, 104, 383-388.
 86. Khedr, M.Z. and Arai, S. (2009) Geochemistry of metasomatized peridotites above subducting slab: a case study of hydrous metaperidotites from Happo-One, central Japan. *Journal of Mineralogical and Petrological Sciences*, 104, 313-318.
 87. Payot, B.D., Arai, S., Tamayo, R.A., Jr. and Yumul, G.P., Jr. (2009) What underlies the Philippine Island Arc?: Clues from the Calatun Hill, Tablas Island, Romblon (central Philippines). *Journal of Asian Earth Sciences*, 36, 371-389.
 88. Ishimaru, S., Arai, S. and Shukuno, H. (2009) Metal-saturated peridotite in the mantle wedge inferred from metal-bearing peridotite xenoliths from Avacha volcano, Kamchatka. *Earth and Planetary Science Letters*, 284, 352-360.
 89. Yoshitake, N., Arai, S., Ishida, Y. and Tamura, A. (2009) Geochemical characteristics of chloritization of mafic crust from the northern Oman ophiolite: Implications for estimating the chemical budget of hydrothermal alteration of the oceanic lithosphere. *Journal of Mineralogical and Petrological Science*, 104, 156-163.
 90. Hasebe, N., Carter, A., Hurford, A.J. and Arai, S. (2009) The effect of chemical etching on LA-ICP-MS analysis in determining uranium concentration for fission-track chronometry. In *F. Lisker, B. Ventura and U.A. Glasmacher* (eds.) "Thermochronological methods: from palaeotemperature constraints to landscape evolution models, Special Publications of Geological Society, London, no. 324, 37-46.

91. Morishita, T., Arai, S., Ishida, Y., Tamura, A. and Gervilla, F. (2009) Constraints on the evolutionary history of aluminous mafic rocks in the Ronda peridotite massif (Spain) from trace-element compositions of clinopyroxene and garnet. *Geochemical Journal* 43, 191-206.
92. Michibayashi, K., Oohara, T., Satsukawa, T., Ishimaru, S., Arai, S. and Okrugin, V.M. (2009) Rock seismic anisotropy of the low-velocity zone beneath the volcanic front in the mantle wedge. *Geophysical Research Letters*, 36, L12305, doi:10.1029/2009GL038527.
93. Ahmed, A.H., Arai, S. and Ikenne, M. (2009) Mineralogy and Mineral Paragenesis of the Co-Ni Arsenide Ores of the Bou Azzer, Anti-Atlas, Morocco. *Economic Geology*, 104, 249-266.
94. Ishimaru, S., Arai, S., Tamura, A., Takeuchi, M. and Kiji, M. (2009) Subarc magmatic and hydration processes inferred from a hornblende peridotite xenolith in spessartite from Kyoto, Japan. *Journal of Mineralogical and Petrological Sciences*, 114, 97-104.
95. Yamamoto, J., Nakai, S., Nishimura, K., Kaneoke, I., Kagi, H., Sato, K., Okumura, T., Prikhod'ko, V.S. and Arai, S. (2009) Intergranular trace elements in mantle xenoliths from Russian Far East: An example for mantle metasomatism by hydrous melt. *Island Arc*, 18, 225-241.
96. Ahmed H. A., Arai, S., Abdel-Aziz, Y. M., Ikenne, M. and Rahimi, A. (2009) Platinum-group elements distribution and spinel composition in podiform chromitites and associated rocks from the upper mantle section of the Neoproterozoic Bou Azzer ophiolite, Anti-Atlas, Morocco. *Journal of African Earth Sciences*, 55, 92-104.
97. Ito, K., Hasebe, N., Sumita, R., Arai, S., Yamamoto, M., Kashiwaya, K. and Ganzawa, Y. (2009) LA-ICP-MS analysis of pressed powder pellets to luminescence geochronology. *Chemical Geology* 262, 131-137.
98. Ismail, S.A., Arai, S., Ahmed, A.H. and Shimizu, Y. (2009) Chromitite and peridotite from Rayat, northeastern Iraq, as fragments of a Tethyan ophiolite. *Island Arc*, 18, 175-183.
99. Gahlan, H.M. and Arai, S. (2009) Carbonate-orthopyroxenite lenses from the Late Proterozoic Gerf ophiolite, South Eastern Desert, Egypt: The first record in the Arabian Nubian Shield ophiolites. *Journal of African Earth Sciences*, 53, 70-82.
100. Ishimaru, S. and Arai, S. (2009) Highly silicic glasses in peridotite xenoliths from Avacha volcano, Kamchatka arc; implications for melting and metasomatism within the sub-arc mantle. *Lithos*, 107, 93-106.
101. Arai, S., Tamura, A., Ishimaru, S., Kadoshima, K., Lee, Y.-I. and Hisada, K. (2008) Petrology of the Yugu peridotites in the Gyeonggi massif, South Korea: implications for their origin and hydration process. *Island Arc*, 17, 485-501.
102. Hisada, K., Takashima, S., Arai, S. and Lee, Y.-I. (2008) Early Cretaceous paleogeography of Korea and Southwest Japan inferred from occurrence of detrital

- chromian spinel. *Island Arc*, 17, 471-484.
103. Helmy, H.M., Yoshikawa, M., Shibata, T., Arai, S. and A. Tamura (2008) Corona structure from arc mafic-ultramafic cumulates: the role and chemical characteristics of late magmatic hydrous liquids. *Journal of Mineralogical and Petrological Sciences*, 103, 333-344.
 104. Python, M., Ceuleneer, G. and Arai, S. (2008) Chromian spinels in mafic-ultramafic mantle dykes: evidence for two-stage melt production during the evolution of the Oman ophiolite. *Lithos* 106, 137-154.
 105. Hirauchi, K., Tamura, A., Arai, S., Yamaguchi, H. and Hisada, K. (2008) Fertile abyssal peridotites within the Franciscan subduction complex, central California: possible origin as detached remnants of oceanic fracture zones located close to a slow-spreading ridge. *Lithos*, 105, 319-328.
 106. Ahmed, H.A., Helmy, H.M., Arai, S. and Yoshikawa, M. (2008) Magmatic unmixing in spinel from Late Precambrian concentrically-zoned mafic-ultramafic intrusions, Eastern Desert, Egypt. *Lithos*, 104, 85-98.
 107. Shimizu, Y., Arai, S., Morishita, T. and Ishida, Y. (2008) Origin and significance of spinel-pyroxene symplectite in lherzolite xenoliths from Tallante, southeast Spain. *Mineralogy and Petrology*, 94, 27-43.
 108. Ishimaru, S. and Arai, S. (2008c) Arsenide in a metasomatized peridotite xenolith as a constraint on arsenic behavior in the mantle wedge. *American Mineralogist*, 93, 1061-1065.
 109. Morishita, T., Hattori, K., Terada, K., Matsumoto, T., Yamamoto, K., Takebe, M., Ishida, Y., Tamura, A. and Arai, S. (2008) Geochemistry of apatite-rich layers in the Finero phlogopite-peridotite massif (Italian Western Alps) and ion microprobe dating of apatite. *Chemical Geology*, 251, 99-111.
 110. Ishimaru, S. and Arai, S. (2008b) Nickel enrichment in mantle olivine beneath a volcanic front. *Contributions to Mineralogy and Petrology*, 156, 119-131.
 111. Arai, S. and Ishimaru, S. (2008) Insights into petrological characteristics of the lithosphere of mantle wedge beneath arcs through peridotite xenoliths: A review. *Journal of Petrology*, 49 (D.H. Green vol.), 665-695.
 112. Tamura, A., Arai, S., Ishimaru, S. and Andal, E.S. (2008) Petrology and geochemistry of peridotites from IODP Site U1309 at Atlantis Massif, MAR 30oN: micro- and macro-scale melt penetrations into peridotites. *Contributions to Mineralogy and Petrology*, 155, 491-509. (doi: 10.1007/s00410-007-0254-0)
 113. Ishimaru, S., and Arai, S. (2008a) Calcic amphiboles in peridotite xenoliths from Avacha volcano, Kamchatka, and their implications for metasomatic conditions in the mantle wedge. In *M. Coltorti and M. Gregoire* (eds.) "Metasomatism in Oceanic and Continental

Lithospheric Mantle”, Special Publications of Geological Society, London, no. 293, 35-55.

114. Python, M., Ishida, Y., Ceuleneer, G., and Arai, S. (2007) Trace-element heterogeneities in hydrothermal diopsides: evidence for Ti depletion and Sr-Eu-LREE enrichment during hydrothermal metamorphism of mantle harzburgites. *Journal of Mineralogical and Petrological Sciences*, 102, 143-149.
115. Ali, M. and Arai, S. (2007) Clinopyroxene-rich lherzolite xenoliths from Bir Ali, Yemen - possible product of peridotite/melt reactions. *Journal of Mineralogical and Petrological Sciences*, 102, 137-142.
116. Gahlan, H.A. and Arai, S. (2007) Genesis of peculiarly zoned Co, Zn and Mn-rich chromian spinel in serpentinite of Bou-Azzer ophiolite, anti-Atlas, Morocco. *Journal of Mineralogical and Petrological Sciences*, 102, 69-85.
117. Morishita, T., Arai, S., and Ishida, Y. (2007) Occurrence and chemical composition of amphiboles and related minerals in corundum-bearing mafic rock from the Horoman Peridotite Complex, Japan. *Lithos* 95, 425-440.
118. Arai, S., and Y. Takemoto (2007) Mantle wehrlite from Hess Deep as a crystal cumulate from an ultra-depleted primary melt in East Pacific Rise. *Geophysical Research Letters*, 34, L08302, doi:10.1029/2006GL029198.
119. Morishita, T., Arai, S., and Ishida, Y. (2007) Trace element compositions of jadeite (\pm omphacite) in jadeitites from the Itoigawa-Ohmi district, Japan: implications for fluid processes in subduction zones. *Island Arc*, 16, 40-56.
120. Python, M., Ceuleneer, G., Ishida, Y., Barrat, J.-A. and Arai, S. (2007) Oman diopsidites: a new lithology diagnostic of very high temperature hydrothermal circulation in mantle peridotite below oceanic spreading centres. *Earth and Planetary Science Letters*, 255, 289-305.
121. Ishimaru, S., Arai, S., Ishida, Y., Shirasaka, M., and Okrugin, V.M. (2007) Melting and multi-stage metasomatism in the mantle wedge beneath a frontal arc inferred from highly depleted peridotite xenoliths from the Avacha volcano, southern Kamchatka. *Journal of Petrology*, 48, 395-433.
122. Arai, S., Abe, N., and Ishimaru, S. (2007) Mantle peridotites from the Western Pacific. *Gondwana Research*, 11, 180-199.
123. Arai, S., Shimizu, Y., Ismail, S.A. and Ahmed, A.H. (2006) Low-*T* formation of high-Cr spinel with apparently primary chemical characteristics within podiform chromitite from Rayat, northeastern Iraq. *Mineralogical Magazine*, 70, 499-508.
124. Marchev, P., Arai, S. and Vaselli, O. (2006) Cumulate xenolith series in the Krumovgrad basanite dykes: Evidence for the existing of layered plutons under the Eastern Rhodope metamorphic core-complexes, Bulgaria. In Dilek, Y. and Pavlides, S. (eds.) *Postcollisional*

- Tectonics and Magmatism in the Eastern Mediterranean Region and Asia. Geological Society of America Special Paper 409, p. 237-258.
125. Gahlan, H.A., Arai, S., Ahmed, A.H., Ishida, Y., Abdel-Aziz, Y. M. and Rahim, A. (2006) Origin of magnetite veins in serpentinite from the late Proterozoic Bou-Azzer ophiolite, Anti-Atlas, Morocco: an implication for mobility of iron during serpentinization. *Journal of African Earth Sciences*, 46, 318-330.
 126. Morishita, T., Andal, E. S., Arai, S. and Ishida, Y. (2006) Podiform chromitites in lherzolite-dominant mantle section of the Isabela ophiolite, Philippines. *Island Arc*, 15, 84-101.
 127. Morishita, T., Takazawa, E., Arai, S., Obata, M., Kodera, T. and Gervilla, F. (2006) Corundum-bearing mafic granulite in the Horoman (Japan) and Ronda (Spain) peridotite massifs: Possible remnants of recycled crustal materials in the mantle. *Island Arc*, 15, 2-3.
 128. Rajesh, V.J., Yokoyama, K., Santosh, M., Arai, S., Oh, C.W. and Kim, S. W. (2006) Zirconolite and baddeleyite in an ultramafic suite from southern India: Early Ordovician carbonatite-type melts associated with extensional collapse of the Gondwana crust. *Journal of Geology*, 114, 171-188.
 129. Okamura, H., Arai, S. and Kim, Y.-U. (2006) Petrology of fore-arc peridotite from the Hahajima Seamount, the Izu-Bonin arc, with special reference to chemical characteristics of chromian spinel. *Mineralogical Magazine*, 70, 15-26.
 130. Ahmed, A.H., Hanghøj, K., Kelemen, P.B., Hart, S.R., and Arai, S. (2006) Osmium isotope systematics of the Proterozoic and Phanerozoic ophiolitic chromitites: In-situ ion probe analysis of primary Os-rich PGM. *Earth and Planetary Science Letters*, 245, 777-791.
 131. Arai, S. and Ninomiya, C. (2006) What is the upper mantle peridotite of back-arc basin? *Journal of Geological Society of Thailand*, No. 1, 1-8.
 132. Rajesh, V.J. and Arai, S. (2006) Baddeleyite-apatite-spinel-phlogopite (BASP) rock in Achankovil Shear Zone, south India, as a probable cumulate from melts of carbonatite affinity. *Lithos*, 90, 1-18.
 133. Tamura, A. and Arai, S. (2006) Harzburgite-dunite-orthopyroxenite suite as a record of supra-subduction zone setting for the Oman ophiolite mantle. *Lithos*, 90, 43-56.
 134. Arai, S., Kadoshima, K. and Morishita, T. (2006) Widespread arc-related melting in the mantle section of the northern Oman ophiolite as inferred from detrital chromian spinels. *Journal of Geological Society, London*, 163, 869-879.
 135. Arai, S., Shimizu, Y., Morishita, T., and Ishida, Y. (2006) A new type of orthopyroxenite xenolith from Takashima, the Southwest Japan arc: silica enrichment of the mantle by evolved alkali basalt. *Contributions to Mineralogy and Petrology*. 152, 387-398.
 136. Arai, S. (2005) Role of dunite in genesis of primitive MORB. *Proceedings of the Japan*

- Academy. Ser. B, 81, 14-19.
137. Tamura, A., and Arai, S. (2005) Unmixing spinel in chromitite from the Iwanai-dake peridotite complex, Hokkaido, Japan: a reaction between peridotite and highly oxidized magma in the mantle wedge. *American Mineralogist*, 90, 473-480.
 138. Morishita, T., Ishida, Y., Arai, S. and Shirasaka, S. (2005) Determination of multiple trace element compositions in thin (< 30µm) layers of NIST SRM 614 and 616 using laser ablation ICP-MS. *Geostandards and Geoanalytical Research*, 29, 107-122.
 139. Ahmed, A.H., Arai, S., Abdel-Aziz, Y.M., and Rahimi, A. (2005) Spinel composition as a petrogenic indicator of the mantle section in the Neoproterozoic Bou Azzer ophiolite, Anti-Atlas, Morocco. *Precambrian Research*, 138, 225-234.
 140. Morishita, T., Ishida, Y., and Arai, S. (2005) Simultaneous determination of multiple trace element compositions in thin (< 30 µm) layers of BCR-2G by 193 nm ArF excimer laser ablation-ICP-MS: implications for matrix effect and element fractionation on quantitative analysis. *Geochemical Journal*, 39, 327-340.
 141. Andal, E.S., Arai, S. and Yumul, G.P., Jr. (2005) The Isabela Ophiolite (Philippines): A complete mantle section of a slow spreading ridge-derived ophiolite. *Island Arc*, 14, 272-294.
 142. Matsumoto, T., Morishita, T., Matsuda, J., Fujioka, T., Takebe, M., Yamamoto, K. and Arai, S. (2005) Noble gases in the Finero phlogopite-bearing peridotites. western Italian Alps. *Earth and Planetary Science Letters*, 238, 130-145.
 143. Arai, S., Takada, S., Michibayashi, K., and Kida, M. (2004) Petrology of peridotite xenoliths from Iraya Volcano, Philippines, and its implication for dynamic mantle-wedge processes. *Journal of Petrology*, 45, 369-389.
 144. Morishita, T., Arai, S., and Green, D.H. (2004) Possible Non-melted Remnants of Subducted Lithosphere: Experimental and Geochemical Evidence from Corundum-Bearing Mafic Rocks in the Horoman Peridotite Complex, Japan. *Journal of Petrology*, 45, 235-252.
 145. Nishio, Y., Nakai, S., Yamamoto, J., Sumino, H., Matsumoto, T., Prikhod'ko, V.S. and Arai, S. (2004) Lithium isotopic systematics of the mantle-derived ultramafic xenoliths: implications for EM1 origin. *Earth and Planetary Science Letters*, 217, 245-261.
 146. Hisada, K., Sugiyama, M., Ueno, K., Charusiri, P., and Arai, S. (2004) Missing ophiolitic rocks along the Mae Yuam Fault as the Gondwana/Tethys divide in northern Thailand. *Island Arc* 13, 119-127.
 147. Arai, S., Uesugi, J., and Ahmed, A.H. (2004) The upper crustal podiform chromitite from the northern Oman ophiolite as the stratigraphically shallowest chromitite in ophiolite and its implication for Cr concentration. *Contributions to Mineralogy and Petrology*, 147, 145-154.

148. Yamamoto, J., Kaneoka, I., Nakai, S., Kagi, H., Prikhod'ko, V.S. and Arai, S. (2004) Evidence for subduction-related components in the subcontinental mantle from low $^3\text{He}/^4\text{He}$ and low $^{40}\text{Ar}/^{36}\text{Ar}$ ratio in mantle xenoliths from Far Eastern Russia. *Chemical Geology*, 207, 237-259.
149. Ikehata, K. and Arai, S. (2004) Metasomatic formation of kosmochlor-bearing diopside in peridotite xenoliths from North Island, New Zealand. *American Mineralogist*, 89, 1396-1404.
150. Shimizu, Y., Arai, S., Morishita, T., Yurimoto, H. and Gervilla, F. (2004) Petrochemical characteristics of felsic veins in mantle xenoliths from Tallante (SE Spain): an insight into activity of silicic melt within the mantle wedge. *Transactions of the Royal Society of Edinburgh: Earth Sciences*, 95, 265-276.
151. Morishita, T., Arai, S., Gervilla, F., and Green, D.H. (2003) Closed-system geochemical recycling of crustal materials in alpine-type peridotite. *Geochimica et Cosmochimica Acta*, 67, 303-310.
152. Morishita, T., and Arai, S. (2003) Evolution of spinel-pyroxene symplectite in spinel lherzolites from the Horoman complex Japan. *Contributions to Mineralogy and Petrology*, 144, 509-522.
153. Abe, N., Takami, M., and Arai, S. (2003) Petrological feature of spinel lherzolite xenolith from Oki-Dogo Island: an implication for variety of the upper mantle peridotite beneath southwest Japan. *Island Arc*, 12, 219-232.
154. Arai, S., Ishimaru, S. and Okrugin, V.M. (2003) Metasomatized harzburgite xenoliths from Avacha volcano as fragments of mantle wedge of the Kamchatka arc: an implication for the metasomatic agent. *Island Arc*, 12, 233-246.
155. Morishita, T., Arai, S., and Green, D.H. (2003) Evolution of low-Al orthopyroxene in the Horoman Peridotite, Japan: an unusual indicator of metasomatising fluids. *Journal of Petrology*, 44, 1237-1246.
156. Arai, S., Shimizu, Y., and Gervilla, F. (2003) Quartz diorite veins in a peridotite xenolith from Tallante, Spain: implications for reaction and survival of slab-derived SiO_2 -oversaturated melt in the upper mantle. *Proceedings of the Japan Academy Ser. B.*, 79, 145-150.
157. Ahmed, A.H. and Arai, S. (2003) Platinum-Group minerals in podiform chromitites of the Oman ophiolite. *Canadian Mineralogist*, 41, 597-616.
158. Morishita, T., Arai, S. and Tamura, A. (2003) Petrology of an apatite-rich layer in the Finero phlogopite-peridotite, Italian Western Alps; implications for evolution of a metasomatising agent. *Lithos*, 69, 37-49.
159. Hattori, K., Arai, S., and Clarke, B. (2002) Selenium, tellurium, arsenic and antimony contents in primary mantle sulphides. *Canadian Mineralogist*, 40, 637-650.

160. Ahmed, A.H., and Arai, S. (2002) Unexpectedly high-PGE chromitite from the deeper mantle section of the northern Oman ophiolite and its tectonic implications. *Contributions to Mineralogy and Petrology*, 143, 263-278.
161. Matsumoto, T., Seta, A., Matsuda, J., Chen, Y., and Arai, S. (2002) Helium in the Archean komatiite revisited: significantly high $^3\text{He}/^4\text{He}$ ratios revealed by fractional crushing gas extraction. *Earth and Planetary Science Letters*, 196, 213-225.
162. Yamamoto, J., Kagi, H., Kaneoka, I., Lai, Y., Prikhod'ko, V.S., and Arai, S. (2002) Fossil pressures of fluid inclusions in mantle xenoliths exhibiting rheology of mantle minerals. *Earth and Planetary Science Letters*, 198, 511-519.
163. Ahmed, A.H., Arai, S., and Kadoshima, K. (2002) Possible platinum-group element (PGE) oxides in the PGE-mineralized chromitite from the northern Oman ophiolite. *Journal of Mineralogical and Petrological Sciences*, 97, 190-198.
164. Chutakositkanon, V., Hisada, K., Charusiri, P., and Arai, S. (2001) Tectonic significance of detrital chromian spinels in the Permian Nam Duk Formation, central Thailand. *Geosciences Journal (Korea)*, 5, 89-96.
165. Matsumoto, I., and Arai, S. (2001) Morphological and chemical variation of chromian spinel in dunite-harzburgite complexes from the Sangun zone (SW Japan): implications for mantle/melt reaction and chromitite formation processes. *Mineralogy and Petrology*, 73, 305-323.
166. Ahmed, A.H., Arai, S., and Attia, A.K. (2001) Petrological characteristics of the Pan African podiform chromitites and associated peridotites of the Pan African Proterozoic ophiolite complexes of Egypt. *Mineralium Deposita*, 36, 72-84.
167. Kaneoka, I., Takahashi, N., and Arai, S. (2001) ^{40}Ar - ^{39}Ar analysis of phlogopite in the Horoman Peridotite Complex, Hokkaido, Japan and implications for its origin. *Island Arc*, 10, 22-32.
168. Kadoshima, K., and Arai, S. (2001) Chemical analysis of detrital chromian spinels from the Lizard area, Cornwall: an attempt for lithological and petrological overview of the Lizard peridotite. *Nues Jahrbuch fur Mineralogie Monatshefte (N. Jb. Miner. Mh.)*, 2001, No. 5, 193-209.
169. Matsumoto, I., and Arai, S. (2001) Petrology of dunite/harzburgite with decimeter-scale stratification in a drill core from the Tari-Misaka ultramafic complex, southwestern Japan. *Journal of Mineralogical and Petrological Sciences*, 96, 19-28.
170. Morishita, T., and Arai, S. (2001) Extremely low-Al orthopyroxene in the Horoman peridotite, Japan. *Journal of Mineralogical and Petrological Sciences*, 96, 48-53.
171. Arai, S., Kida, M., Abe, N., and Yurimoto, H. (2001) Petrology of peridotite xenoliths in alkali basalt (11 Ma) from Boun, Korea: an insight into the upper mantle beneath the East Asian continental margin. *Journal of Mineralogical and Petrological Sciences*, 96, 89-99.

172. Morishita, T., and Arai, S. (2001) Petrogenesis of corundum-bearing mafic rock in the Horoman Peridotite Complex, Japan. *Journal of Petrology*, 42, 1279-1299.
173. Morishita, T., Arai, S., and Gervilla, F. (2001) High-pressure aluminous mafic rocks from the Ronda peridotite massif, Southern Spain: significance of sapphirine- and corundum-bearing mineral assemblages. *Lithos*, 57, 143-161.
174. Arai, S., Hirai, H., and Uto, K. (2000) Mantle peridotite xenoliths from the Southwest Japan arc and a model for the sub-arc upper mantle structure and composition of the Western Pacific rim. *Journal of Mineralogical and Petrological Sciences*, 95, 9-23.
175. Arai, S., and Kida, M. (2000) Origin of fine-grained peridotite xenoliths from Iraya volcano of Batan island, Philippines: deserpentinization or metasomatism at the wedge mantle beneath an incipient arc? *Island Arc*, 9, 458-471.
176. Hisada, K., Arai, S., and Lee, Y.I. (1999) Tectonic implications of Lower Cretaceous chromian spinel-bearing sandstones in Japan and Korea. *Island Arc*, 8, 336-348.
177. Abe, N., Arai, S., and Yurimoto, H. (1999) Texture-dependent geochemical variations of sub arc mantle peridotite from Japan island arcs. *Proceedings of VIIth International Kimberlite Conference, J.B. Dawson Vol.*, 13-22.
178. Kadoshima, K., and Arai, S. (1999) Primary petrological characteristics of peridotites in the Sangun zone of northern Kyushu: a preliminary note from detrital chromian spinel. *Journal of Mineralogy, Petrology and Economic Geology*, 94, 97-108.
179. Shukuno, H., and Arai, S. (1999) Olivine-chromian spinel compositional relationships of the Cenozoic alkali basalts from Southwest Japan: implications for their mantle restite. *Journal of Mineralogy, Petrology and Economic Geology*, 94, 120-140.
180. Arai, S., Prichard, H.M., Matsumoto, I., and Fisher, P.C. (1999) Platinum-group minerals in podiform chromitite from the Kamuikotan zone, Hokkaido, northern Japan. *Resource Geology*, 49, 39-47.
181. Arai, S., Prichard, H.M., Matsumoto, I., and Fisher, P.C. (1999) Potarite (Pd Hg) in thermally metamorphosed dunite from the Inazumi-yama ultramafic complex, southwestern Japan: an implication for the behaviour of mercury in PGE mineralization in peridotite. *Mineralogical Magazine*, 63, 369-377.
182. Arai, S. (1998) Comments of the paper "Primitive basaltic melts included in podiform chromites from the Oman ophiolite" by P. Schiano et al. *Earth and Planetary Science Letters*, 156, 117-119.
183. Matsukage, K. and Arai, S. (1998) Jadeite, albite and nepheline as inclusions in spinel of chromitite from Hess Deep, equatorial Pacific: their genesis and implications for serpentinite diapir formation. *Contributions to Mineralogy and Petrology*, 131, 111-122.
184. Arai, S. and Matsukage, K. (1998) Petrology of a chromitite micropod from Hess Deep, equatorial Pacific: a comparison between the abyssal and alpine-type podiform chromitites.

Lithos, 43, 1-14.

185. Abe, N., Arai, S. and Yurimoto, H. (1998) Geochemical characteristics of the uppermost mantle beneath the Japan island arcs: implications for upper mantle evolution. *Physics of Earth and Planetary Interiors*, 107, 233-247.
186. Hisada, K., Arai, S., and Yamaguchi, T. (1998) Detrital chromian spinel from Site 960 in the Cote D'Ivoire-Ghana Transform margin. *Proceedings of ODP, Scientific Results*, 159, 133-139.
187. Ninomiya, A. and Arai, S. (1998) Polygenetic olivine phenocrysts in Okete basanite, New Zealand. *Journal of Mineralogy, Petrology and Economic Geology*, 93, 235-249.
188. Arai, S., Matsukage, K., Isobe, E. and Vysotskiy, S. (1997) Concentration of incompatible elements in oceanic mantle: Effect of melt/wall interaction in stagnant or failed conduits within peridotite. *Geochimica et Cosmochimica Acta*, 61, 671-675.
189. Arai, S., Kadoshima, K., Manjoorsa, M.V., David, C.P. and Kida, M. (1997) Chemistry of detrital chromian spinels as an insight into petrological characteristics of their source peridotites: an example from the Ilocos Norte ophiolite, northern Luzon, Philippines. *Journal of Mineralogy, Petrology and Economic Geology*, 92, 137-141.
190. Arai, S. (1997) Control of wall-rock composition on the formation of podiform chromitites as a result of magma/peridotite interaction. *Resource Geology*, 47, 177-187.
191. Matsumoto, I. and Arai, S. (1997) Characterization of chromian spinel as a tool of petrological exploration for podiform chromitite. *Resource Geology*, 47, 189-199.
192. Harada, T. and Arai, S. (1997) Application of detrital chromian spinel chemistry to geochemical survey of chromite deposit: examples of the Kamuikotan tectonic belt, central Hokkaido, Japan. *Resource Geology*, 47, 201-209.
193. Miyake, K., Arai, S. and Okuno, M. (1997) Petrology of peridotite and chromitite in Wakamatsu mine of the Tari-Misaka ultramafic complex, western Japan. *Resource Geology*, 47, 211-221.
194. Hisada, K., Aihara, K. and Arai, S. (1997) Significance of detrital spinels from the Cretaceous Atokura Formation, Kanto Mountains, central Japan. *Memoirs of the Geological Society of Japan*, 48, 85-91.
195. Hisada, K., Aihara, K. and Arai, S. (1997) Mesozoic peridotite protrusion in the Joetsu belt, central Japan. *Journal of the Geological Society of the Philippines*, 70, 224-234.
196. Arai, S. (1997) Origin of podiform chromitites. *Journal of Asian Earth Sciences*, 15, 303-310.
197. Matsumoto, I., Arai, S. and Yamauchi, H. (1997) High-Al podiform chromitites in dunite-harzburgite complexes of the Sangun zone, central Chugoku district, Southwest Japan. *Journal of Asian Earth Sciences*, 15, 295-302.
198. Arai, S. and Abe, N. (1996) Detrital minerals in surface sediments from Hess Deep,

- equatorial Pacific: implication for the lithological spread of mafic-ultramafic rocks. *Proceedings of ODP, Scientific Results 147*, 451-457.
199. Arai, S. and Matsukage, K. (1996) Petrology of the gabbro-troctolite-peridotite complex from Hess Deep, equatorial Pacific: implications for mantle-melt interaction within the oceanic lithosphere. *Proceedings of ODP, Scientific Results 147*, 135-155.
 200. Toramaru, A., Ishiwatari, A., Matsuzawa, M., Nakamura, M. and Arai, S. (1996) Vesicle layering in solidified intrusive magma bodies: a newly recognized type of igneous structure. *Bulletin of Volcanology*, 58, 393-400.
 201. Arai, S. and Abe, N. (1995) Reaction of orthopyroxene in peridotite xenoliths with alkali basalt melt and its implication for genesis of alpine-type chromitite. *American Mineralogist*, 80, 1041-1047.
 202. Arai, S. and Yurimoto, H. (1995) Possible sub-arc origin of podiform chromitites. *The Island Arc*, 4, 104-111.
 203. Arai, S. (1994) Characterization of spinel peridotites by olivine-spinel compositional relationships: Review and interpretation. *Chemical Geology*, 113, 191-204.
 204. Arai, S. and Yurimoto, H. (1994) Podiform chromitites of the Tari-Misaka ultramafic complex, southwestern Japan, as mantle-melt interaction products. *Economic Geology*, 89, 1279-1288.
 205. Hisada, K. and Arai, S. (1994) Serpentinite protruded into fore-arc region: implications of detrital chromian spinels in Cretaceous sandstones of the Kanto Mountains, Japan. *Proceedings of 29th International Geological Congress, Part A*, 153-164.
 206. Arai, S. and Abe, N. (1994) Podiform chromitite in the arc mantle: chromitite xenoliths from the Takashima alkali basalt, southwest Japan arc. *Mineralium Deposita*, 29, 434-438.
 207. Arai, S. (1994) Compositional variation of olivine-chromian spinel in Mg-rich magmas as a guide to their residual spinel peridotites. *Journal of Volcanology and Geothermal Research*, 59, 279-293.
 208. Hisada, K. and Arai, S. (1993) Detrital chrome spinels in Sanchu Cretaceous sandstone, central Japan: indicator of serpentinite protrusion into fore-arc region. *Plaeogeography, Plaeoclimatology, Palaeoecology*, 105, 95-109.
 209. Arai, S. (1992) Chemistry of chromian spinel in volcanic rocks as a potential guide to magma chemistry. *Mineralogical Magazine*, 56, 173-184.
 210. Arai, S. (1991) Petrological characteristics of the upper mantle peridotites beneath the Japan Island Arcs - Petrogenesis of spinel peridotites -. *Soviet Geology Geophysics (Geologiya i Geofizika)*, 32, 8-26.
 211. Arai, S. (1991) The Circum-Izu Massif peridotite, central Japan, as back-arc basin mantle fragments of the Izu-Bonin arc system. In Peters, Tj. et al. (eds.) *Ophiolite Genesis and Evolution of the Oceanic Lithosphere*. Kluwer Acad. Pub., Dordrecht, 807-822.

212. Arai, S. and Okada, H. (1991) Petrology of serpentine sandstone as a key to tectonic development of serpentine belts. *Tectonophysics* 195, 65-81.
213. Arai, S. (1990) What kind of magmas could be equilibrated with ophiolitic peridotites? In: Malpas, J. et al. (eds.) *Ophiolites: Oceanic Crustal Analogues*. Proceedings of the Symposium "TROODOS 87", Geological Survey Department of Ministry of Agriculture and Natural Resources, Nicosia, Cyprus, 557-565.
214. Arai, S. and Takahashi, N. (1989) Formation and compositional variation of phlogopites in the Horoman peridotite complex, Hokkaido, northern Japan: implications for origin and fractionation of metasomatic fluids in the upper mantle. *Contributions to Mineralogy and Petrology*, 101, 165-175.
215. Goto, K. and Arai, S. (1987) Petrology of peridotite xenoliths in lamprophyre from Shingu, southwestern Japan: implications for origin of Fe-rich mantle peridotites. *Mineralogy and Petrology*, 37, 137-155.
216. Uto, K., Hirai, H., Goto, K. and Arai, S. (1987) K-Ar ages of carbonate- and mantle nodule-bearing lamprophyre dikes from Shingu, central Shikoku, Southwest Japan. *Geochemical Journal*, 21, 283-290.
217. Arai, S. (1987) An estimation of the least depleted spinel peridotite on the basis of olivine-spinel mantle array. *Nues Jahrbuch für Mineralogie Monatshefte*, 1987, 347-354.
218. Hirai, H. and Arai, S. (1987) H₂O-CO₂ fluids supplied in alpine-type mantle peridotites: electron petrology of relic fluid inclusions in olivines. *Earth and Planetary Science Letters*, 85, 311-318.
219. Arai, S. (1986) K/Na variation in phlogopite and amphibole of upper mantle peridotites due to fractionation of the metasomatic fluids. *Journal of Geology*, 94, 436-444.
220. Arai, S. (1986) "Iron meteorite paragenesis", a new group of mineral inclusions in diamond. *Neues Jahrbuch für Mineralogie Monatshefte*, 1986, 463-466.
221. Arai, S. and Hirai, H. (1986) Nickelian manganoan subcalcic actinolite in a metachert from the Mineoka belt, central Japan. *Canadian Mineralogist*, 24, 475-477.
222. Hirai, H. and Arai, S. (1986) Formation of analcime and phillipsite in hydrous basanites from Southwestern Japan. *Neues Jahrbuch für Mineralogie Abhandlungen*, 153, 163-176.
223. Arai, S. and Hirai, H. (1985) Compositional variation of calcic amphibole in Mineoka metabasites, central Japan, and its bearing on the actinolite-hornblende miscibility relationship. *Lithos*, 18, 187-199.
224. Arai, S. and Hirai, H. (1985) Relics of H₂O fluid inclusions in mantle-derived olivine. *Nature*, 318, 276-277.
225. Arai, S. (1984) Igneous mineral equilibria in some alpine-type peridotites in Japan. In: Sunagawa, I. (ed.) *Materials Science of the Earth's Interior*. Terra Pub., Tokyo, 445-460.
226. Arai, S. (1984) Pressure-temperature dependent compositional variation of phlogopitic

- micas in upper mantle peridotites. *Contributions to Mineralogy and Petrology*, 87, 260-264.
227. Hirai, H. and Arai, S. (1983) Finding of nepheline in some alkali basalts from southwestern Japan. *Journal of the Geological Society of Japan*, 89, 531-534.
 228. Arai, S. (1981) Petrology of basalts from Site 487, Deep Sea Drilling Project Leg 66, Middle America trench area off Mexico. *Initial Reports of D.S.D.P.*, 66, 711-722.
 229. Arai, S. (1980) Dunite-harzburgite-chromitite complexes as refractory residue in the Sangun-Yamaguchi zone, western Japan. *Journal of Petrology*, 21, 141-165.
 230. Arai, S. and Saeki, Y. (1980) Ultramafic-mafic inclusions from Sannomegata crater, Oga Peninsula, Japan, with special reference to the petrographical difference from the Ichinomegata inclusions. *Journal of the Geological Society of Japan*, 86, 705-708.
 231. Uchida, T. and Arai, S. (1978) Petrology of ultramafic rocks from the Boso Peninsula and the Miura Peninsula. *Journal of the Geological Society of Japan*, 84, 561-570.
 232. Arai, S. and Fujii, T. (1978) Petrology of ultramafic rocks from Site 395. *Initial Reports of D.S.D.P.*, 45, 587-594.
 233. Arai, S. and Uchida, T. (1978) Highly magnesian dunite from the Mineoka belt, central Japan. *Journal of the Japanese Association of Mineralogists, Petrologists and Economic Geologists*, 73, 176-179.
 234. Arai, S. (1978) Chromian spinel lamellae in olivine from the Iwanai-dake peridotite mass, Hokkaido, Japan. *Earth and Planetary Science Letters*, 39, 267-273.
 235. Arai, S. (1975) Contact metamorphosed dunite-harzburgite complex in the Chugoku district, western Japan. *Contributions to Mineralogy and Petrology*, 52, 1-16.
 236. Arai, S. (1974) "Non-calciferous" orthopyroxene and its bearing on the petrogenesis of ultramafic rocks in Sangun and Joetsu zones. *Journal of the Japanese Association of Mineralogists, Petrologists and Economic Geologists*, 69, 343-353.
 237. Arai, S. (1973) Compositional variation of olivines in rocks of the Tari-Misaka ultramafic complex and its interpretation. *Proceedings of the Japan Academy*, 49, 649-653.