Japan Association of Mineralogical Sciences

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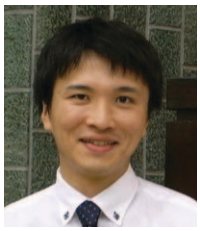
JAPAN ASSOCIATION OF MINERALOGICAL SCIENCES AWARDEES

The Japan Association of Mineralogical Sciences (JAMS) is proud to announce the recipients of its society awards. The awards were presented at the Society's annual meeting in Mito, Japan, on September 10, 2011. The Japan Association of Mineralogical Sciences Award for Young Scientist is awarded annually to a maximum of two scientists under 37 years of age for exceptional contributions to the mineralogical and related sciences. The Japan Association of Mineralogical Sciences Award for Applied Mineralogy is awarded once a year to one scientist who has made remarkable contributions to applied mineralogy. The recipients of the Japan Association of Mineralogical Sciences Award, the Manjiro Watanabe Award, and the Japan Association of Mineralogical Sciences Research Paper Award will be announced in the next issue. Congratulations to all the winners!

JAMS Award for Young Scientist to Hiroaki Ohfuji and Satoko Ishimaru



Hiroaki Ohfuji is an associate professor at the Geodynamic Research Center, Ehime University. He received his PhD degree from Cardiff University, UK, where he studied the self-organization mechanism of framboidal pyrite, a raspberry-like micrometer-sized cluster of several microcrystals, under the guidance of Prof. David Rickard. Through detailed electron microscope observations of many framboids from various localities, he discovered that the pyrite microcrystals are in icosahedral packing. This finding is significant because it not only changes our perception of framboidal pyrite as a "spherical" cluster, but it is also the first report of a dense multiparticle icosahedral material in nature. He also described a variety of microcrystal packings in framboidal pyrite—icosahedral, face-centered cubic, and random packing—and revealed that self-organization is achieved by the nucleation of monodisperse microcrystals, followed by the aggregation and reorientation of individual microcrystals driven by the minimization of surface free energy. His study is the first systematic mineralogical and crystallographic investigation on framboidal pyrite, and it contributes greatly to the understanding of the origin and nature of this form of pyrite, which have remained a mystery for more than half a century. Currently, he is expanding his research to the investigation of the formation of microtextures and to the phase-transition mechanism and kinetics of synthetic diamond and other high-pressure minerals.

Satoko Ishimaru is an assistant professor in the Faculty of Science, Kumamoto University. She obtained her PhD degree from Kanazawa University under the supervision of Professor Shoji Arai. She revealed the petrographical and geochemical characteristics of peridotite xenoliths from Avachinsky (Avacha) volcano on the volcanic front of the Kamchatka arc through detailed microscopic observations and chemical analyses. She used this information to unravel the mantle wedge processes beneath the volcanic front. The Avacha peridotites were metasomatized by silicic melts and fluids, forming secondary orthopyroxenes at the expense of olivine. The peridotites occasionally contain highly silicic glasses associated with euhedral to subhedral secondary orthopyroxenes, indicating the activity of these melts and fluids within the mantle wedge. She also found several specific metasomatic modifications of the mantle peridotite. The presence of Fe–Si alloys and metallic phases within the mantle wedge suggests the activity of reducing fluids. The presence of "Ni-rich spots" (the highest NiO content in olivine is 5.3 wt%) in a fine-grained peridotite indicates the activity of a S–Ni-rich metasomatic agent, possibly a peculiar melt. These metasomatic events are apparently unusual, but they are possibly characteristic of the subfrontal upper mantle. Her work has provided a glimpse into processes in this part of the mantle, and she plans to substantiate her hypotheses by carrying out further research.

JAMS Award for Applied Mineralogy to Akira Monkawa

Akira Monkawa is a researcher at Tokyo Metropolitan Industrial Technology Research Institute. He started his research in the field of applied mineralogy after obtaining his PhD degree from the University of Tokyo under the supervision of Professor Masamichi Miyamoto. Hydroxylapatite (HAp) is a major inorganic component of bone and teeth tissues, and it has excellent biocompatibility and high osteoconductivity. The HAp-related bioceramics have various applications such as bone substitute, coating substance of metal implants, inorganic-polymer composites, and cell culture. Akira Monkawa devised (1) a method for surface modification of HAp using an organosilane and (2) a method for fabricating an ultrathin HAp layer on a gold surface for protein adsorption analysis by the QCM-D (quartz crystal microbalance) technique.

The interfacial interaction between collagen and HAp in a nanoregion was controlled by depositing an organosilane, *n*-octadecyltrimethoxysilane (ODS: $-CH_3$) or aminopropyltriethoxysilane (APTS: NH_2) by chemical vapor deposition. The morphologies of the collagen adsorbed on the surfaces of HAp and HAp deposited by APTS were similar, but the morphology of the collagen adsorbed on the ODS-deposited HAp surface was apparently different, because of the hydrophobic interaction between the organic head group of $-CH_3$ and the residual groups of collagen. Monkawa's group also developed a method for coating a gold QCM-D sensor with an ultrathin layer of HAp nanocrystals, such that the nanocrystals cover the surface evenly and bind tightly to the surface. The HAp sensor operated in liquid media with high stability and sensitivity. The HAp sensor can be used for the qualitative and conformational analysis of protein adsorption.

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