



From the World to Kumamoto University

Advancing Steel-materials Research with Kumamoto University's One-of-a-Kind Apparatus Graduate School of Science and Technology

2nd year doctoral candidate, Advanced Technology
Mr. Kwak Kwangsik

Mr. Kwak Kwangsik says he hopes that by uncovering the unique characteristics in the structural organization of ferrous material, he can design and develop new, basic materials. Previously a student at Kumamoto University, he has returned to do research after a period working in industry.

As a child, Mr. Kwak was interested in the design and construction of vehicles such as automobiles and airplanes. After researching ceramics in the New Materials Engineering department at Pai Chai University in Daejeon, Korea, he studied abroad at the Advanced Materials Research Lab at Kumamoto University in 2005. His main reason for choosing Kumamoto University was that he wanted to do advanced research using the micro-material testing device developed in Professor Kazuki Takashima's lab. A revolutionary device, it extracts a microscopic specimen from the structural organization of ferrous material, and then, on a micrometer-scale organization not able to be tested by normal devices, it evaluates the dynamic properties at a micro-organizational level by pulling and bending the specimen. When Mr. Kwak learned of a research lab that had independently developed such a device, he knew he wanted to study there.



The micro-material testing device, developed at the Advanced Materials Research Lab. This device examines the mechanical properties of minerals.

reported to be very malleable at the micro-structure level, a characteristic that could help overcome its natural brittleness. Intrigued by this characteristic, Mr. Kwak returned to the Takashima Research Lab in 2013 and has been mainly researching martensite.

In 2009, Mr. Kwak finished his graduate studies and went to work at a Japanese company. He was involved in producing bearings for automobiles, but it was here he encountered "martensite." Although the structural organization of martensite is hard, its downside is that it is very brittle and fractures easily. However, it was

When he first came to Kumamoto University, Mr. Kwak could hardly speak any Japanese and sometimes felt depressed. However, he never gave up on himself, and with the friends he made, he never felt like going home. He also met his wife at Kumamoto University, another good thing to come out of studying here.



Mr. Kwak participated in ICOMAT 2104, held in Bilbao, Spain. His presentation topic was "Mechanical characterization of hierarchical microstructure in lath martensite structure using microtension testing".

Almost every day Mr. Kwak is busy with research, but on days off, he enjoys hiking with his wife. He wants to continue researching the design and development of new high-grade materials and to make his contribution to the world by enriching and improving people's lives.