

NANOSTRUCTURED METALLIC MATERIALS - DESIGNING MATERIALS BY VISUALIZATION OF ATOMS USING 3D ATOM PROBE

K. Hono

National Institute for Materials Science, Tsukuba 305-0047, Japan

A recent research trend in the metallurgical community is to refine the microstructural scale from the conventional micron order to the nanoscale dimension. When a crystal grain size becomes smaller than a few nanometers, where the dislocation activity is lost and the ferromagnetic exchange coupling becomes significant, various unique mechanical and magnetic properties appear. The characterization of such nanocrystalline materials that are produced by various processing routes can be performed most powerfully using the atom probe technique. In this talk, we will give an overview on our recent research effort on the development of nanocrystalline magnetic materials and nanocrystalline ultrahigh strength materials. Based on 3DAP analysis results, we optimize the nanostructures so that improved magnetic and mechanical properties can be achieved.

Kazuhiro Hono received a B.S. and M.S. in Materials Science from Tohoku University in 1982 and 1984, respectively, and a Ph.D. in Metals Science and Engineering from the Pennsylvania State University in 1988. Following post-doctoral research at Carnegie Mellon University in the Department of Materials Science and Engineering, he moved to the Institute for Materials Research at Tohoku University as a Research Associate in 1990. He then moved to the National Research Institute for Metals (now National Institute for Materials Science) as a Senior Researcher in 1995 and is now a Fellow of NIMS and a principal investigator at the International Center for Materials Nanoarchitectonics. He is also a Professor of the Materials Science Program at the Graduate School of Pure and Applied Science at the University of Tsukuba. His research interests include microstructure-property relationships of magnetic materials, nanocrystalline and amorphous alloys, nanostructure characterization by atom probe field ion microscopy and transmission electron microscopy.
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