

Materials Science Colloquia 2022-23

Multi-scale microstructure analysis toward development of high-performance metallic alloys *

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Room 1B-38, Bldg B5, Nakamozu Campus

Abstract

The microstructure is closely related to the materials' properties. Because the microstructure features that affect the properties lie in a wide range of length scales from micron- to atomic-scale, it is essential to analyse the microstructure in multi-scale using various microscopy techniques, including scanning electron microscope (SEM), transmission electron microscope (TEM), and atom probe tomography (APT).

This presentation first introduces advanced microscopy techniques for analysing the microstructure of metallic materials by going over recent microstructure analysis studies of precipitation-hardenable magnesium alloys, neodymium magnets, and nanoscale hydrogen mapping in 3D by APT. Further, the talk will also address how we can utilize insights into the microstructure to understand the microstructure origin of the properties and develop high-performance metallic alloys such as novel heat-treatable wrought magnesium alloys and Dy-free (or less) high coercivity neodymium magnets.

* The lecture will be delivered in Japanese.

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