

The Development of the Shielded Secondary Electron Microscope at KAERI

Wednesday, September 24, 2014 11:30 AM (30 minutes)

KAERI developed a shielded secondary electron microscope, which was remodeled from the Philips XL-30 model in 1998. The SEM was installed inside a glovebox, which had the shielding wall of 17 cm carbon steel and the confinement wall of hardened glass. Also, the glovebox was connected to the deep under pressure (DUP) line of a HVAC system. The shielded SEM has been applied to fractography of a spent fuel pellet, crud analysis of a PWR cladding, surface inspection of the contact area between grid spring and fuel rod, hydride morphology analysis of a cladding and so on.

Currently, we have developed the quantitative analysis techniques by the WDS-SEM. As a part of the development, we remodeled a sputter coater for hotcell and made a quantitative analysis program for a WDS-SEM including the function of inspecting the beam stability. We have plan to analyze fission products like Xenon and Neodymium inside a spent fuel and dopants like Manganese and Chromium of doped UO₂ by the techniques.

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Session Classification: Remote Handling

Track Classification: Remote Handling