Applications Data Sheet

3-D Observation of Materials with Hitachi's HD-2000 Dedicated STEM

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RECONSTRUCTION OF A TILT SERIES PROVIDES USEFUL 3-DIMENSIONAL INFORMATION FOR EVALUATION AND ANALYSIS OF MATERIALS.

Performing a tilt series in STEM and then reconstructing the image stack provides useful 3-dimensional information for evaluation and analysis of materials. Typically, samples are tilted through to very high angles with images acquired at each degree of tilt and then software is utilized to reconstruct the image stack. This type of application can be accomplished in STEM, with a smaller angular range, while still providing useful 3-dimensional information for image analysis.

Below a sample of 5 nm hollow palladium particles on a 200 nm amorphous silica sphere was tilted through approximately 6 degrees. Both secondary and z-contrast images were acquired at each degree of tilt and then reconstructed to show the 3-dimensional information. As the image is animated, it is possible to see the palladium particle distribution around the entire sphere

Running the included GIF files will display the animated image stack.

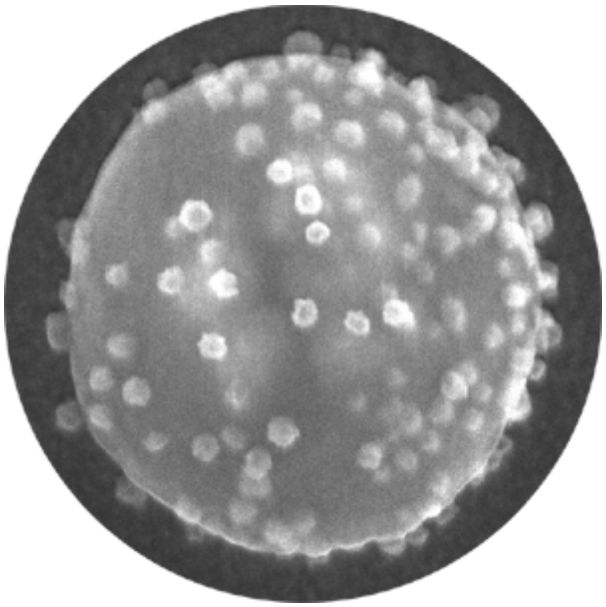

Figure 1 200kV SE Image, 250kX
Stereo90.gif

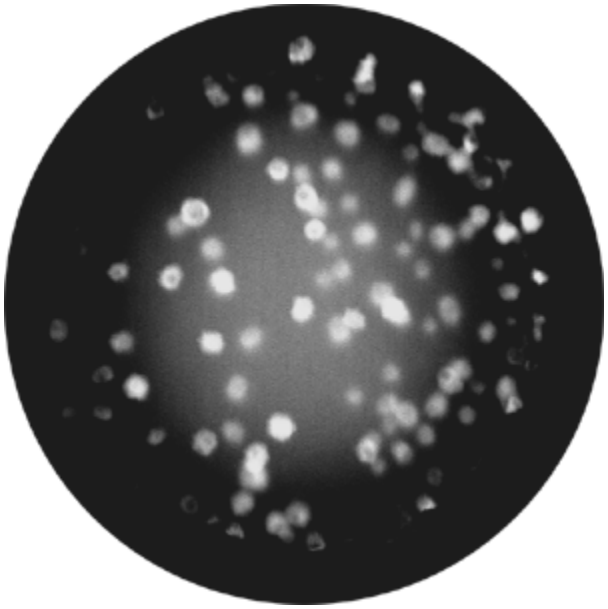

Figure 1 200kV ZC Image, 250kX
StereoZC90.gif

Data courtesy of Oak Ridge National Laboratory-High Temperature Materials Lab, Oak Ridge, TN
