Application Note

Cryo-SEM imaging of Latex Paint

related instrument Leica EM VCT100, Leica EM ACE600
Cryo-SEM Imaging of Latex Paint

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PROCEDURE

A thin layer of latex paint was spread on a clean, scored, silicon chip. The sample was immediately plunge frozen in liquid ethane and transferred under LN₂ to the Leica EM VCT100 loading station where it was placed in the customized sample holder. The holder was secured by the Leica EM VCT100 shuttle and transferred into the Leica EM ACE600 equipped with a cryo stage for freeze fracturing, freeze etching and platinum coating.

The sample was fractured using the optional scalpel on door and was freeze etched for 5 minutes at -95°C. After freeze etching a 5 nm coating of platinum was sputtered (standard: 35 mA, 5 x 10⁻² mbar, 8 x 10⁻⁶ mbar base vaku-um) onto the surface in preparation for SEM imaging.

Below are images of the optional scalpel on door in position for fracturing the sample.

The fractured, coated sample was placed back into the Leica EM VCT100 shuttle and transferred to a Hitachi SU-8230 FESEM for imaging. The image reveals a uniform coating of platinum without coating induced artifacts as well as a complete lack of ice contamination or frost on the surface. The latex particles are easily identifiable as a stacked lattice. There is slight separation from the silicon chip providing insight to the planar surface and the thickness of the sample applied to the chip. The image was captured at 0.3 kV under decelerating conditions at a magnification of 20.0kx using a combination SE-BSE detectors.
RESULTS

Using the Leica EM VCT100 in conjunction with the Leica EM ACE600 provides an exceptionally quick and clean process workflow for imaging samples under cryo conditions.
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