

Application Note

Leica EM HPM100, Leica EM VCT100

High Pressure Freezing, Cryo-SEM

Superior Cryopreparation of Biological and Industrial
Samples

Commercially available hand creams

Living up to Life

Leica
MICROSYSTEMS

Leica EM HPM100, Leica EM VCT100

Commercially available hand creams

Protocol:

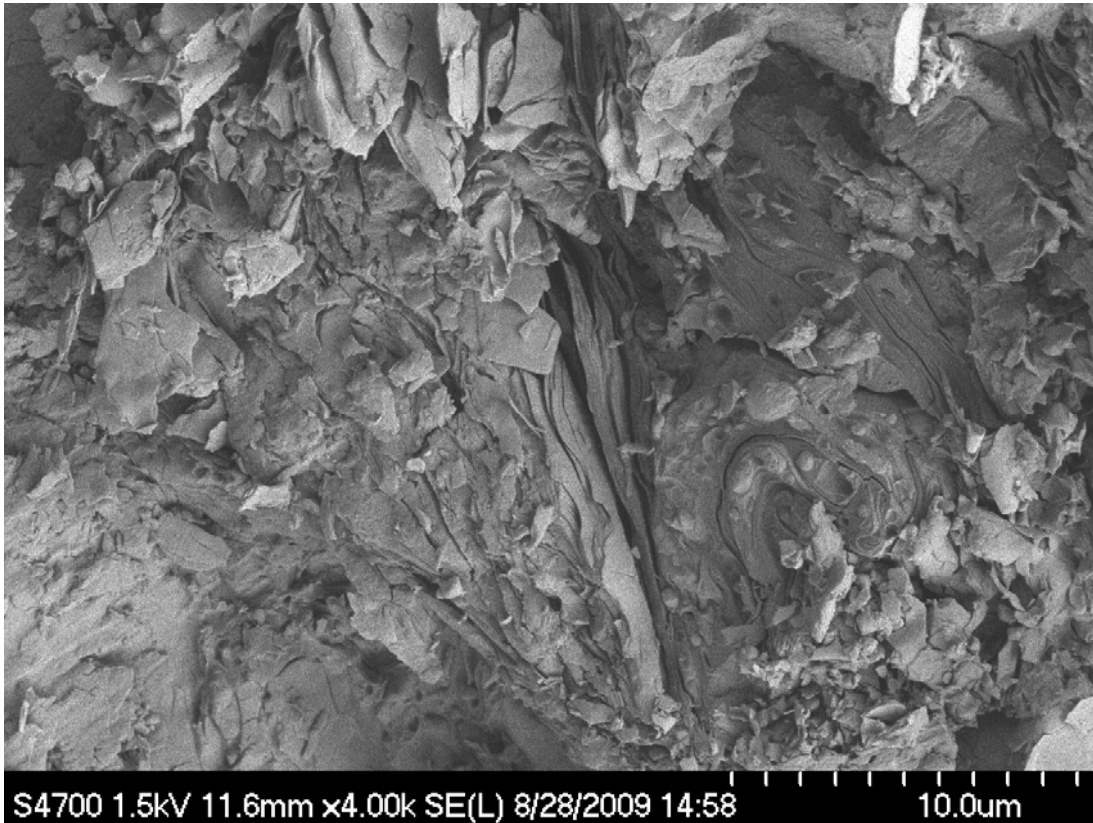
Hand creams having different water contents were applied into the 100 µm cavities of two 3 mm type A sample carriers which were then closed cream sides inwards. The sample assembly was high pressure frozen with a Leica EM HPM100 and moved to a cooled Leica EM VCT100 loading station. The closed carriers were mounted on a universal sample carrier, withdrawn into an EM VCT100 shuttle then transferred into a Leica EM BAF060. Samples were fractured by pushing the top carrier off with the fracturing knife at -140°C, then they were high angle rotary shadowed with platinum/carbon. The samples were again withdrawn into the EM VCT100 shuttle and then moved to the cryo-SEM. They were imaged with a Hitachi S4700 FE-SEM with the EM VCT100 CryoStage at -125°C.

Summary:

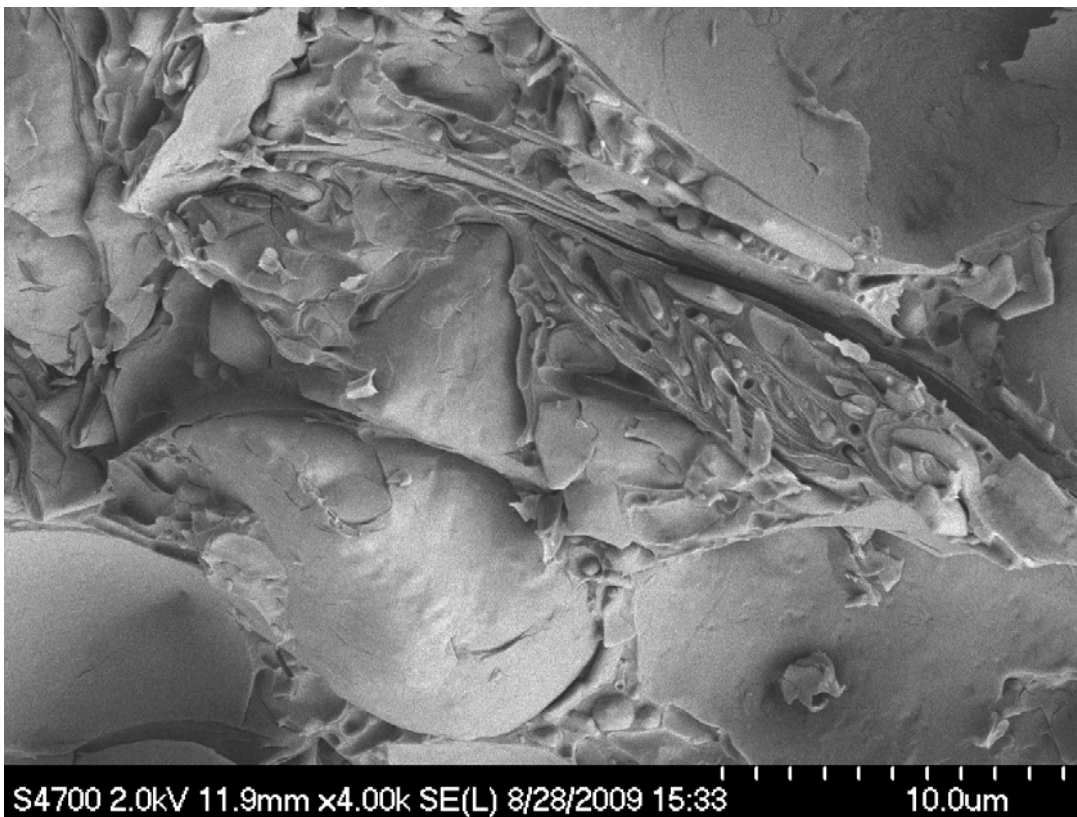
Procedure	Reagents	Parameters
High pressure freezing		3 mm diameter sample carriers
Freeze fracture		-140°C
Coating	5 nm Platinum-Carbon	70° angle to the sample surface with 90 RPM rotation
Transfer		Cooled EM VCT100 Shuttle
Imaging		Cryo-SEM at -125°C

Results:

High pressure freezing followed by freeze fracture and cryo-SEM are well-suited for determining the structure of water-containing industrial materials. Multiple samples can be processed and examined within a short time with an SEM equipped with a Leica EM VCT100 cryo-stage.



Hand cream with high water content shows mostly large emulsified pockets of aqueous material interspersed between few lipid sheets.



Hand cream with low water content shows mostly lipid sheets with very small pockets of emulsified aqueous content.

Samples prepared August 28, 2009 by Kim Rensing Ph.D. at the University of British Columbia, BiImaging Facility, Vancouver, Canada