

# Application Note

## Leica EM VCT100

Cryo-SEM

Superior Cryopreparation of Biological and Industrial Samples  
Mint leaves

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MICROSYSTEMS

# Leica EM VCT100

## Mint leaves

### Protocol:

Peppermint leaves were mounted on a Leica EM VCT100 sample stage with tissue-tec and then frozen by partially immersing the stage block in LN<sub>2</sub> in the EM VCT100 loading box. Trichomes, including the frozen essential oil and the surface of the underlying oil-secreting cells, were revealed by selectively hand-fracturing in the EM VCT100 loading box using a LN<sub>2</sub>-cooled insect pin attached to a wooden handle. Frozen samples were then withdrawn into the EM VCT100 shuttle and transferred directly to a Hitachi S4700 FE-SEM with an EM VCT100 Cryo-Stage. Surface ice was sublimated by warming to -105°C for 10 minutes then the samples were imaged uncoated at -125°C.

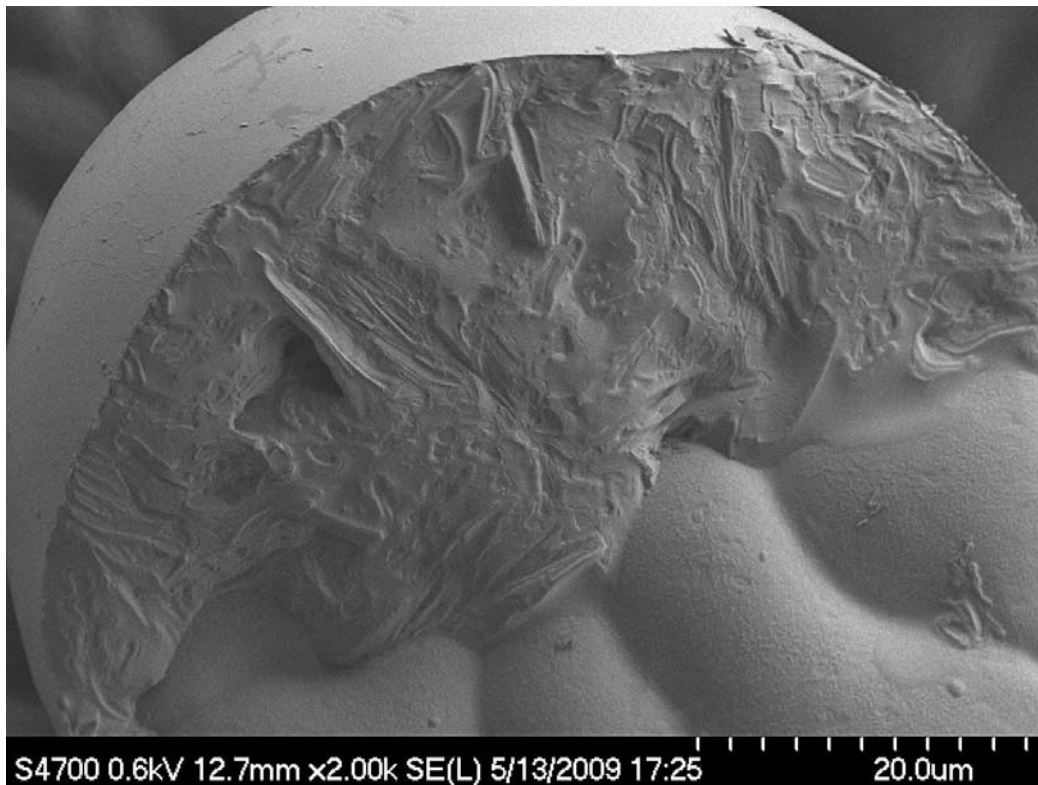
### Summary:

Procedure	Reagents	Parameters
Freezing		Directly in LN <sub>2</sub>
Freeze fracture		By hand with cooled needle
Coating	none	
Transfer		Cooled EM VCT100 Shuttle
Sublimation		-105°C for 10 minutes
Imaging		-125°C

**Results:**



The very delicate leaf surface features, such as the hair-like trichomes and the essential oil-accumulating glandular trichomes, were intact after transfer and with minimal sublimation there was no surface ice contamination.



Trichome structures, including the frozen essential oil and the surface of the underlying oil-secreting cells, were revealed by selectively hand-fracturing in the Leica EM VCT100 loading box prior to transfer into the FE-SEM. This remains well-frozen and is readily imaged using the EM VCT100 Cryo-Stage.