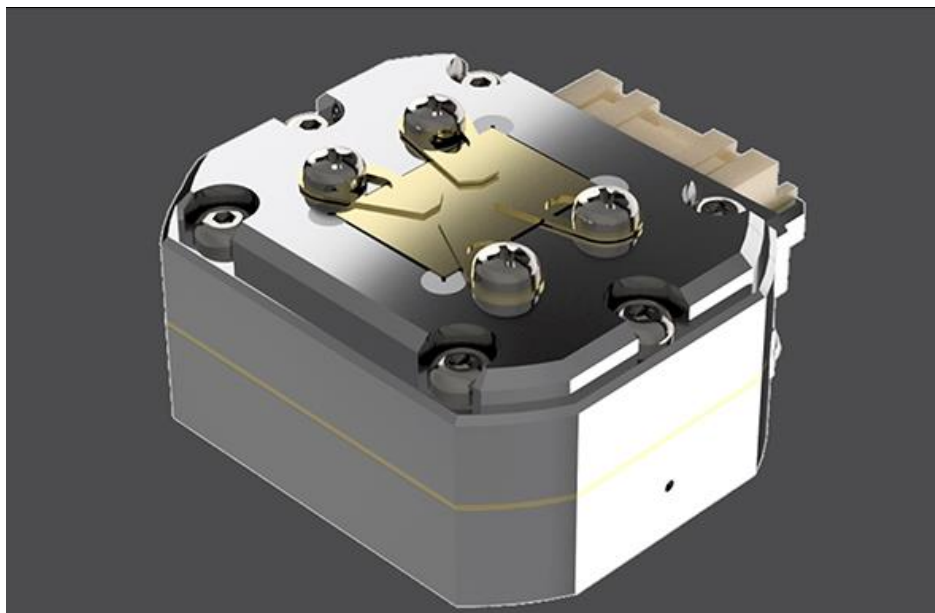


Application Notes

Peltier Cooling SEM Stage 80

Peltier Cooling SEM Stage 80

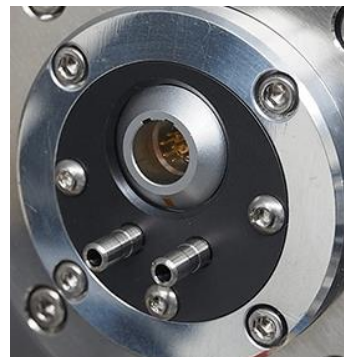


Basic Item

Lab Chiller



Feed Through Flange



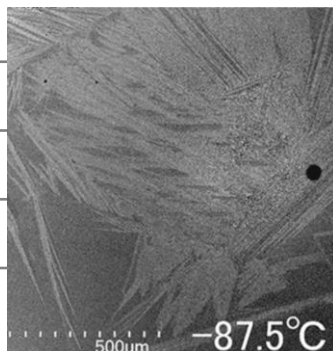
Temp. Controller



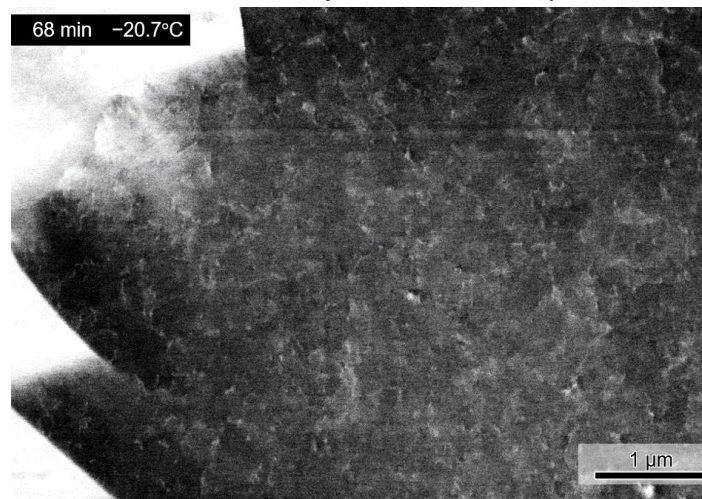
Feed Through Flanges are used for energizing cables, temperature measuring cables.
The flange shape fits to each FIB-SEM manufacturers.

Specification

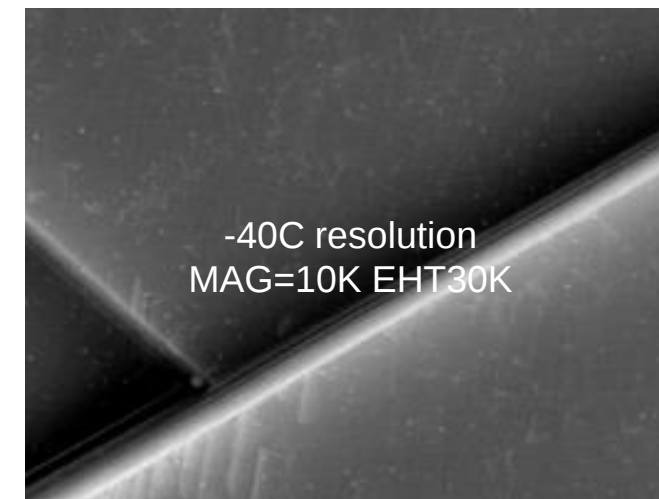
• Mechanism	:	Peltier / Chiller
• Temp. range	:	-80°C ~ RT
• Temp. Stability	:	±0.005°C
• Size / Weight	:	φ42 mm / 125g
• Application	:	Serial-sectioning EBSD etc.
• Chiller spec.	:	-20°C *Low vibration



The material was finally observed at temp. below -50°C.

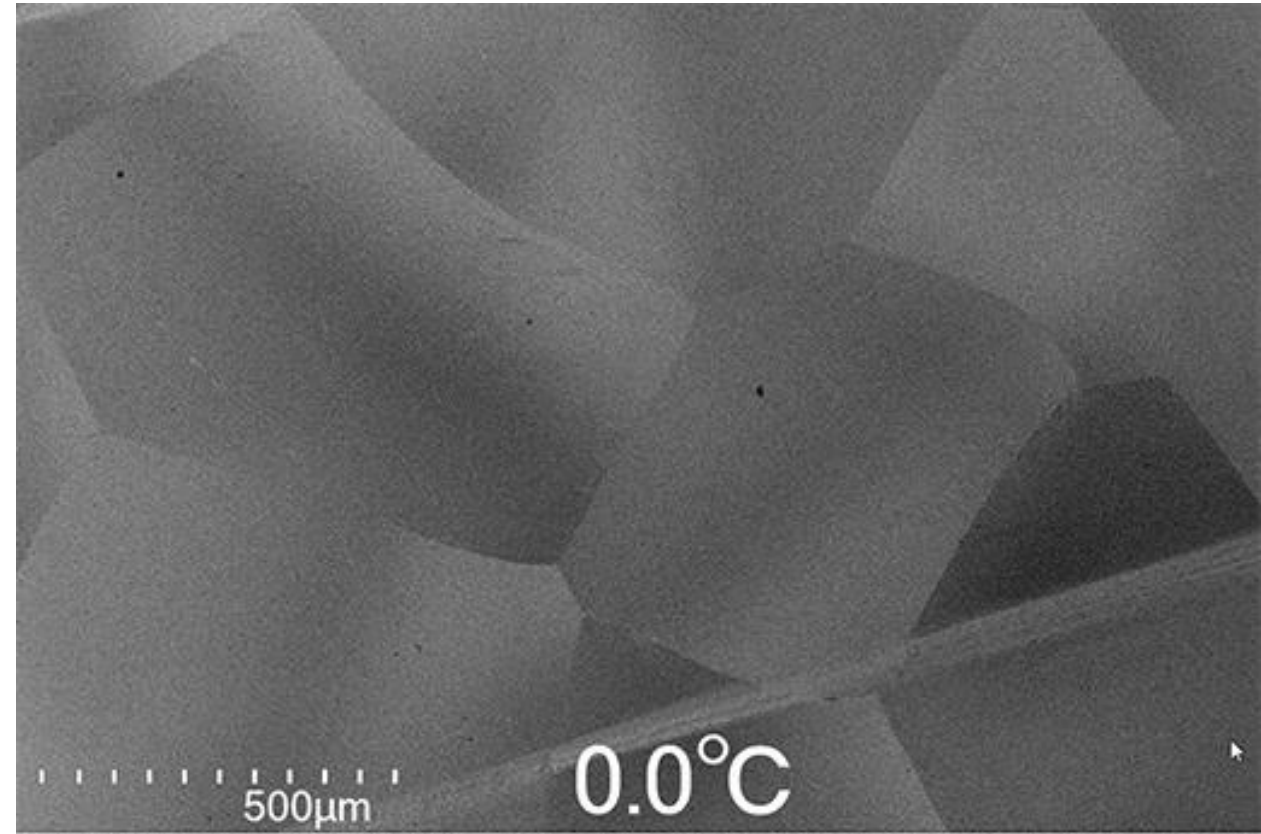
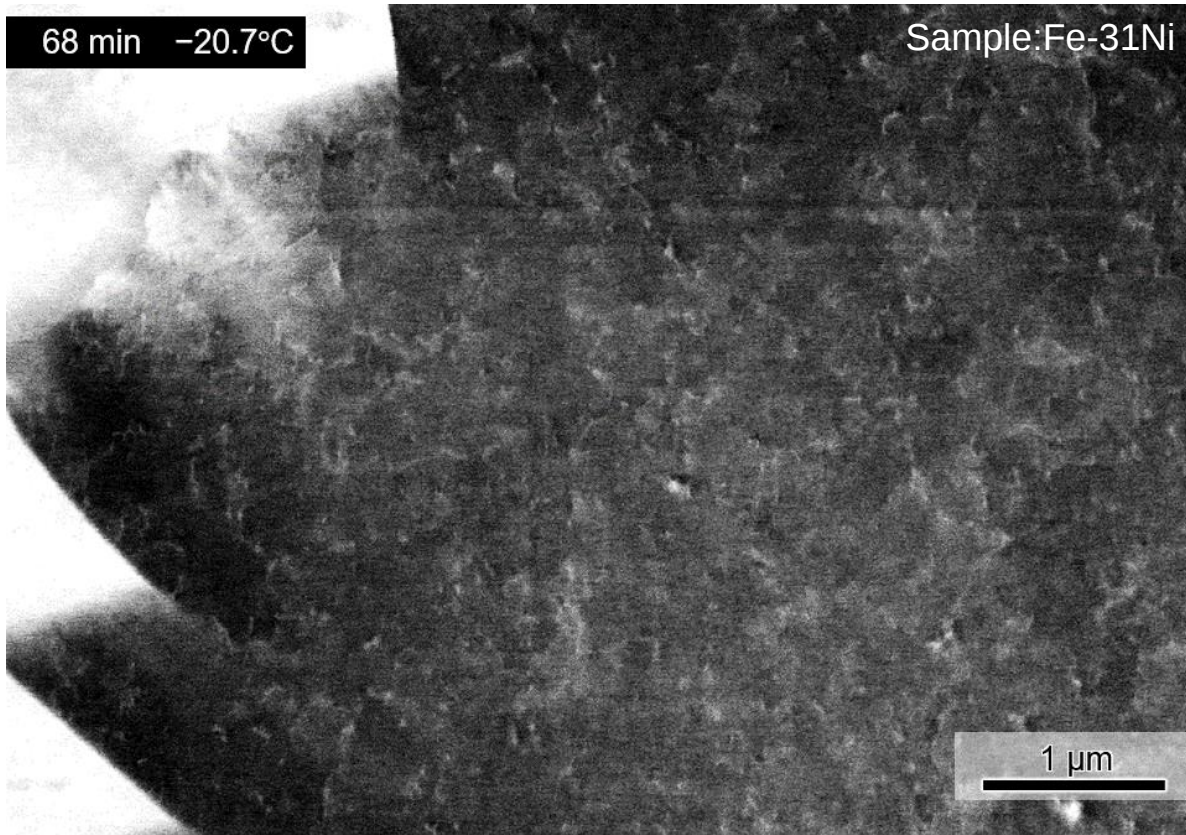


Good resolution

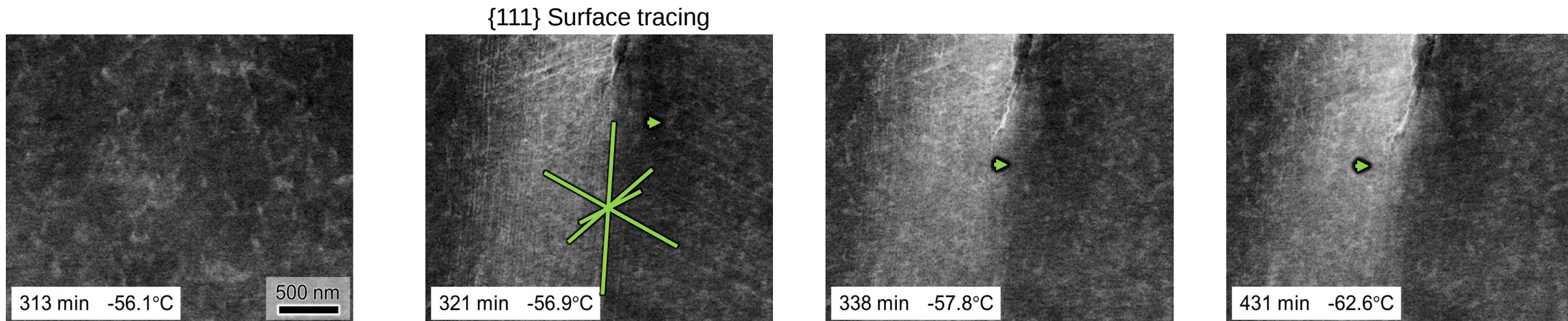


Insitu observation of phenomena occurred from under-50°C

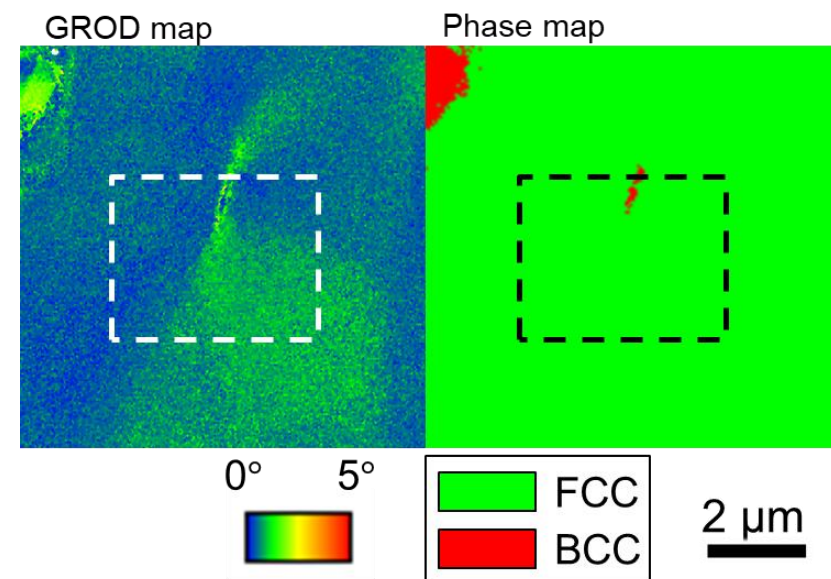
The material was not altered up to -50°C, but gradually became observable under -50°C, the temperature below -50°C is very important in experiments.



Martensite transformation



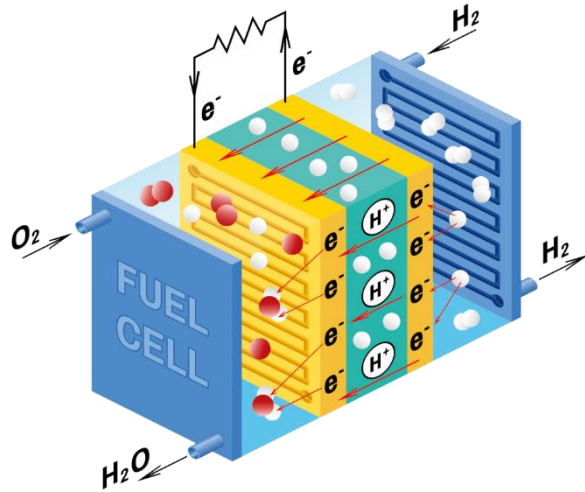
- Dislocations were introduced due to uniform plastic deformation in the vicinity of martensite.
- Dislocations almost exactly match the traces on the plane
- The model of helical dislocations introduced in the strain field relaxation of G.B. Olson et al.



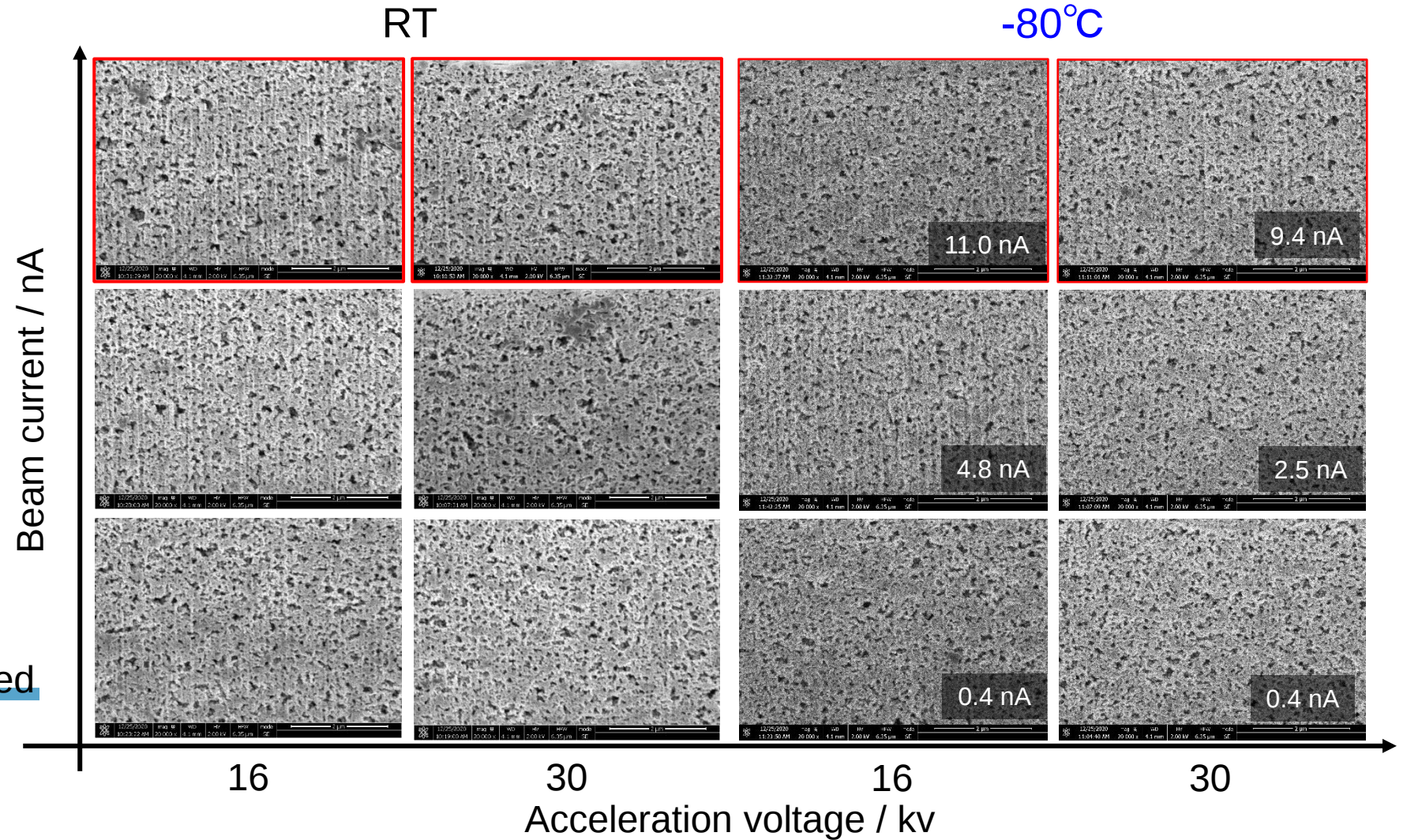
Acceleration voltage (cross-sectioning of carbon electrode)

FIB cross-sectioning of fuel cell electrodes (Pt/C)

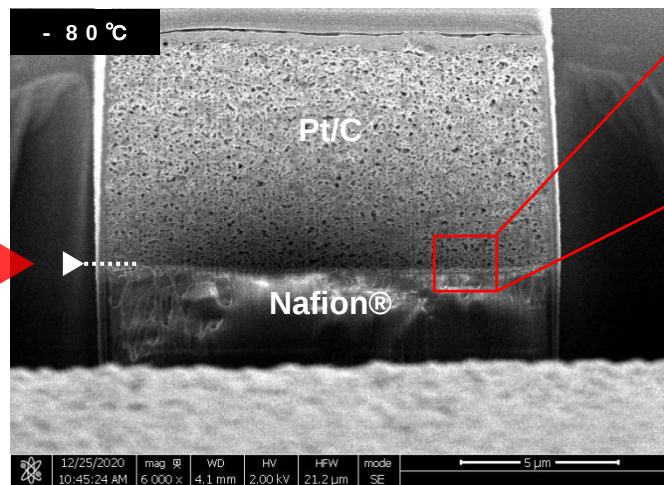
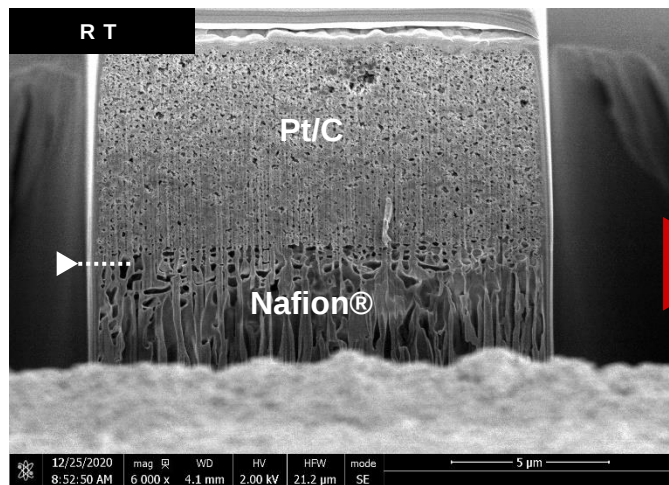
Fuel Cell Diagram



The effect is more pronounced with high current.



Fuel cell RT VS -80°C

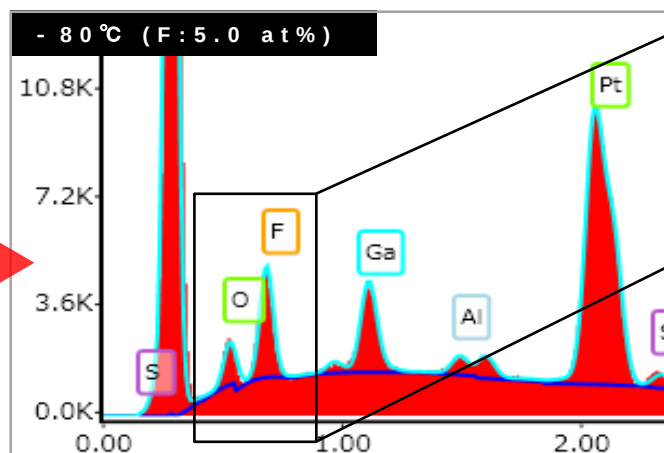
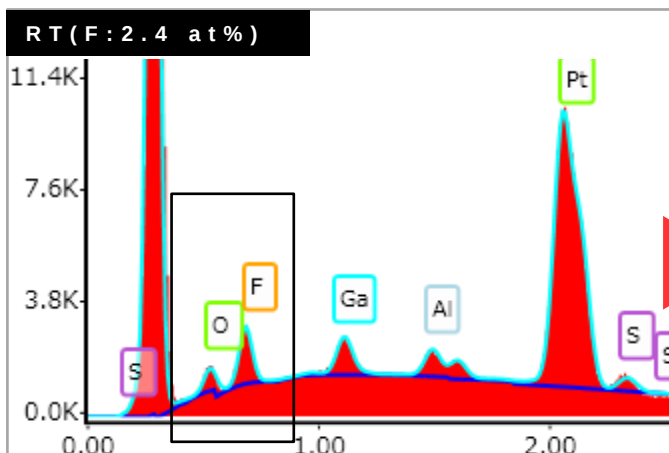


Nafion® is not altered.

Importance of stable observation under -80°C

•Sample	: Electrode of fuel cell
•Accelerating voltage	: 30kv
•Beam current	: 2.5nA
•Temperature	: RT vs -80°C

EDS analysis under cryo-condition



RT vs -80°C

About 2 times than RT.

Fluorine is easy to go away from material by the e- beam irradiation.

•Sample	: Electrode of fuel cell
•Accelerating voltage	: 5kv
•Beam current	: 0.17nA
•Temperature	: RT vs -80°C

Provision of data



Dr. Junko Matsuda,
Kyushu University

