NanoSIMS Analysis of Automotive Coatings

The NanoSIMS 50L can provide the highest lateral resolution among secondary ion mass spectrometers and can simultaneously achieve high sensitivity and high mass resolution. Here, we introduce examples of measuring automotive coatings using NanoSIMS.

What is NanoSIMS ?

Imaging & Depth Profiling

- High lateral resolution
- High transmission
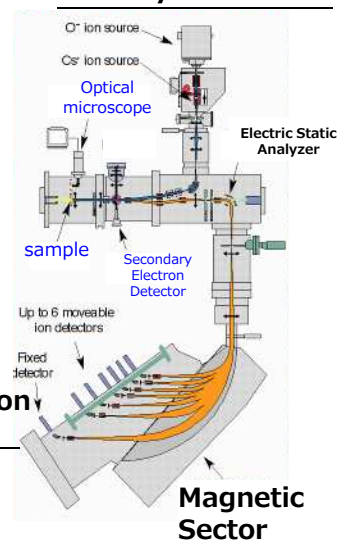- High mass resolution using magnetic sector
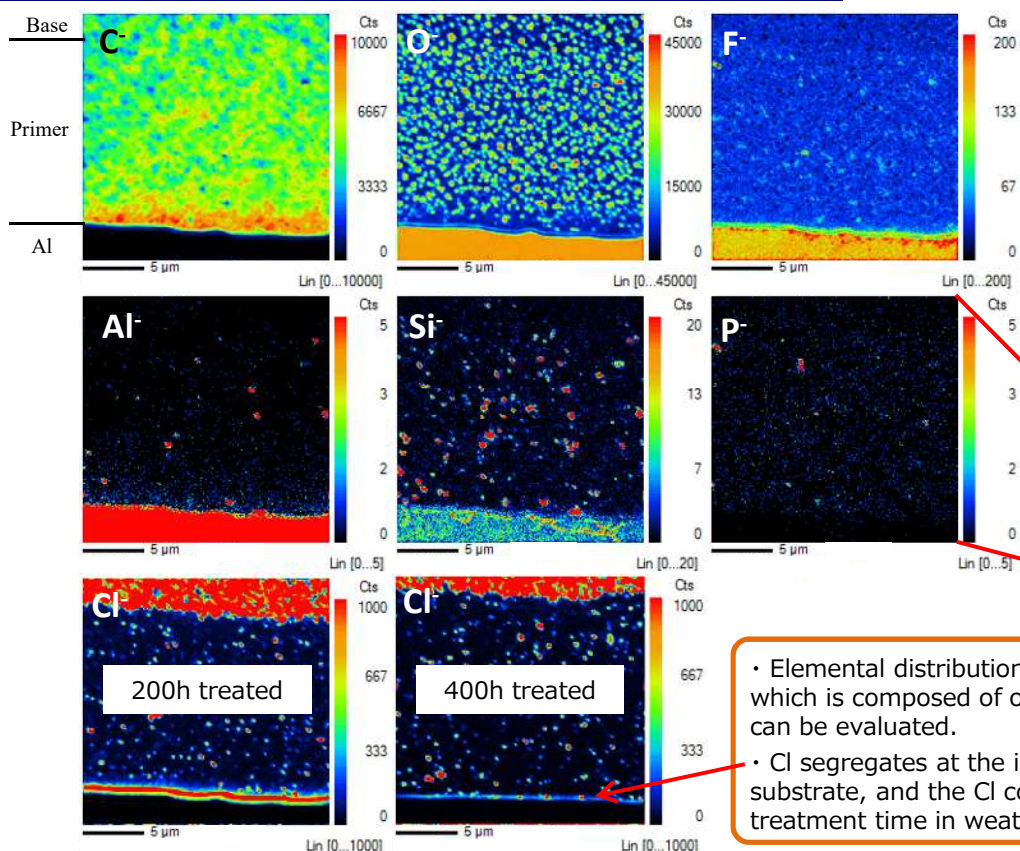

Courtesy: AMETEK

NanoSIMS 50L

- Primary ion : Cs^+, O^-
- Minimum beam size : 50 nm
- Detection limit : ppm~
- Mass analyzer :
  double focusing mass spectrometer
- Number of ions detected : 7
- Analysis depth :
  10 nm~ several 100 nm

Multicollection system

Primary Ion Source

Magnetic Sector

Elemental imaging of automotive coating cross sections

SEM image

- surface
- Clear coat 40 μm
- Base coat 50 μm
- Primer coat 20 μm
- Al substrate

10 μm

· Elemental distributions in an automotive coating, which is composed of organic/inorganic materials, can be evaluated.

· Cl segregates at the interface of primer coat and substrate, and the Cl concentration depends on treatment time in weathering test.

Elemental distribution in an automotive coating corss section can be evaluated with high lateral resolution.