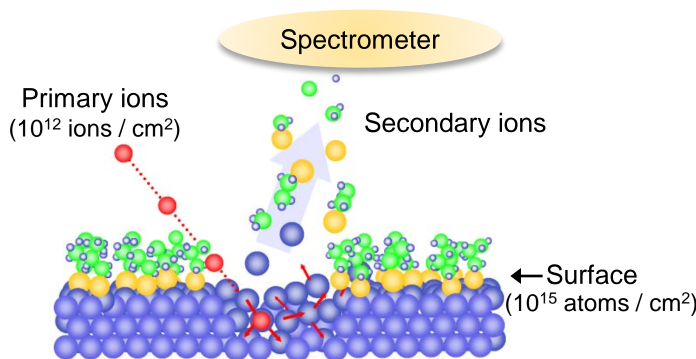
Surface Analysis by TOF-SIMS

TOF-SIMS is one of the most sensitive technique for the surface analysis. It is widely used for the troubleshooting related to the surface or the interface of devices, the component analysis of small areas or thin layers, and so on.

Features

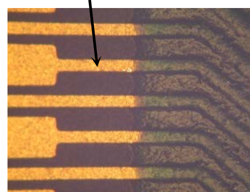
- ✓ High sensitivity for the surface (1-2 nm)
- ✓ Elemental and molecular information
- ✓ Imaging of detected compound (Distribution)
- ✓ Small area (~μm) analysis
- ✓ Depth profiling by using with sputtering ions

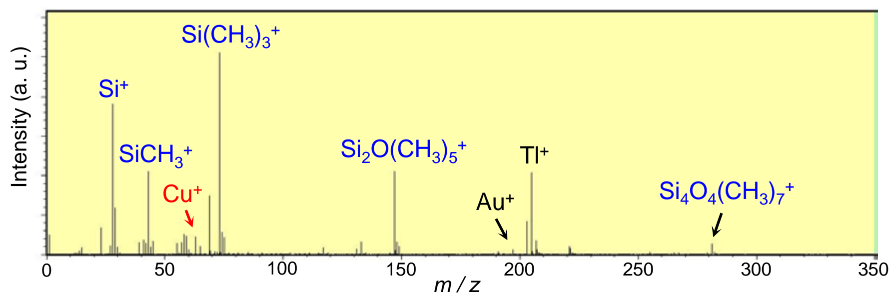
Principle of TOF-SIMS



Application 1. (*spectroscopy*) : Surface analysis of the Cu wiring

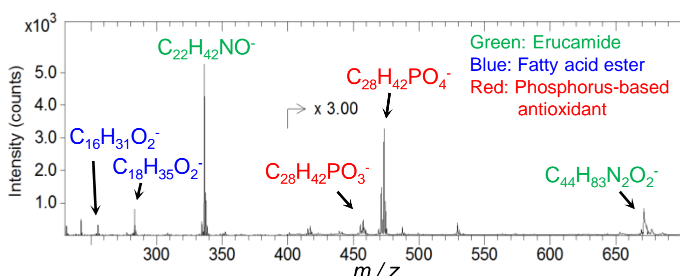
Analysis area
(40×40μm)

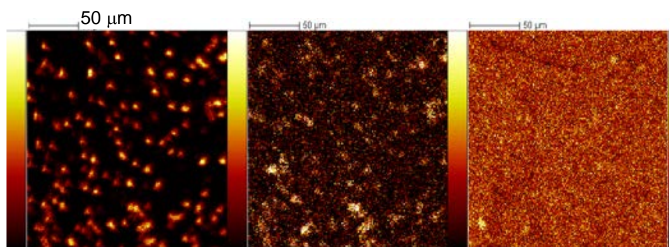




- ✓ Although the wiring surface is plated with Au, Cu was detected. It means that Cu has migrated from under layer.
- ✓ Polydimethylsiloxane was detected as a contamination.

Application 2. (*Imaging*) : Surface analysis of the polypropylene (PP) film

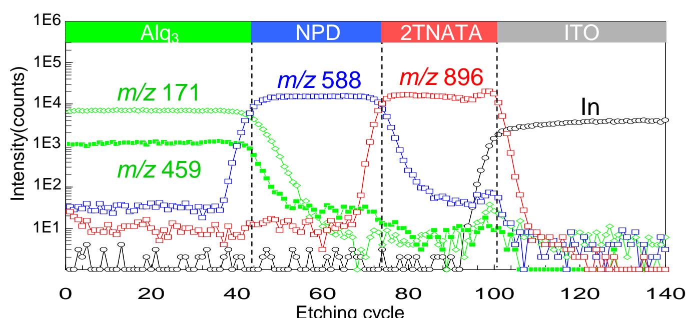


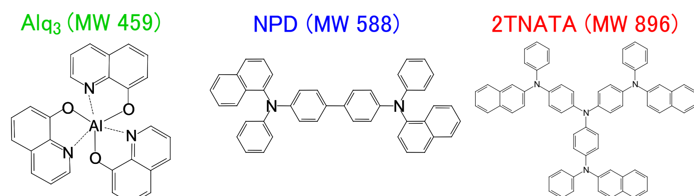


Erucamide | Fatty acid ester | Phosphorus-based antioxidant

- ✓ Some polymer additives were detected on the PP film surface. It seems to be caused by bleed out.
- ✓ Imaging of detected ions shows that erucamide cohere and phosphorus-based antioxidant disperse on the surface.

Application 3. (*Depth profiling*) : Component analysis of the organic multilayer in OLED





- ✓ TOF-SIMS with the gas cluster ion beam (GCIB) etching enable us to perform depth profiling of molecules and specific chemical structures in organic materials.

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