

YKI, Institute for Surface Chemistry



We look deeper

How deep do we go?

With the help of northern Europe's most advanced equipment in surface and colloid chemistry, we take a total solution approach to your problem. Our unique combination of instruments enables us to provide in-depth measurements and analyses, based on a variety of approaches, for faster, more reliable results.

Damaged hair

How do the ingredients in your product affect the quality and feel of the customer's hair?

Mold on the wall

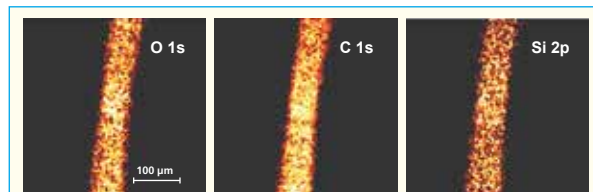
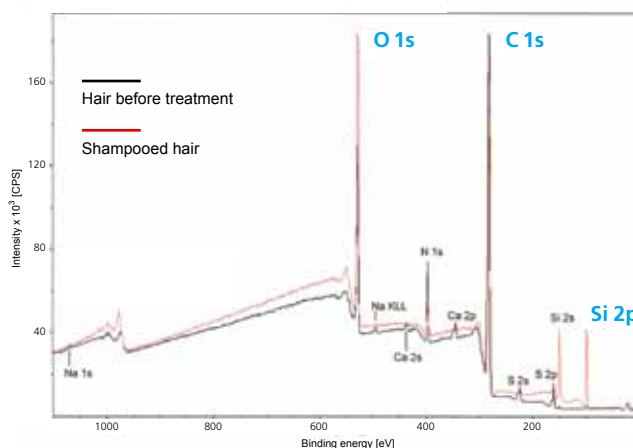
How do the molecules in the paint move and how do we change the formula to make the paint weather-resistant?

Too much medication

How is the active ingredient dispersed in your product and how does this affect the dosage?

Paper jam

How are the starch and pigment distributed on the cellulose fibers in the copying paper?



Study of a shampoo designed to leave silicone on the hair to make it feel softer. The XPS images show the chemistry along a brown hair fiber after shampooing. The imaging of oxygen, carbon and silicon makes it possible to see how the formulation affects the surface.

Techniques for Surface Analysis

	XPS/ESCA X-ray photoelectron spectroscopy. Also known as electron spectroscopy for chemical analysis	ToF-SIMS Time-of-flight secondary ion mass spectrometry	Raman spectroscopy	FT-IR-ATR & IRAS Fourier transform infrared spectroscopy – attenuated total reflection mode. Infrared reflection-absorption spectroscopy	EDX Energy-dispersive X-ray analysis from scanning electron or environmental scanning electron microscopy (SEM or ESEM)
Analysis depth	2-10 nm	1-2 nm for static SIMS	0.5 μm	0.5-5 μm ATR, nm IRAS	0.5-5 μm
What chemical information does it give?	Elements Functional groups Oxidation states	Elements Molecules Functional groups Isotopes	Molecules Functional groups Crystallinity	Molecules Functional groups	Elements
Detection limit	0.1 atom %	ppm-ppb	1 %	1 % ATR	0.1-0.5 wt %
Quantification	Good	Moderate	Moderate	Moderate	Moderate
Lateral (x-y) resolution in imaging/mapping	<3 μm	0.2 μm	0.3 μm	1-2 μm	0.5 μm
What is the pressure during the measurement?	Ultrahigh vacuum	Ultrahigh vacuum	Atmospheric	Atmospheric	High vacuum in SEM; Atmospheric with regard to water vapour in ESEM
Radiation in ⇔ out	X-rays ⇔ Electrons	Ions ⇔ Ions	Photons ⇔ Photons	Photons ⇔ Photons	Electrons ⇔ X-rays
Confocal Raman	Raman spectroscopy+confocal microscopy allows for depth sectioning with a vertical resolution of about 0.5 μm				
AFM	Atomic force microscopy gives topography, viscoelastic properties, force mapping (adhesion, stiffness, etc.)				

YKI – Your Research and Innovation Partner in Applied Surface Chemistry

YKI is a world-leading industrial research institute with a focus on innovation transfer in applied surface chemistry. YKI develops and transfers competence, solutions and new technologies to industrial sectors where surface chemistry is of importance. YKI works with a variety of industries including personal care, pharmaceutical, food, packaging and cleantech. YKI is part of Sweden's leading research institute SP Technical Research Institute of Sweden.



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