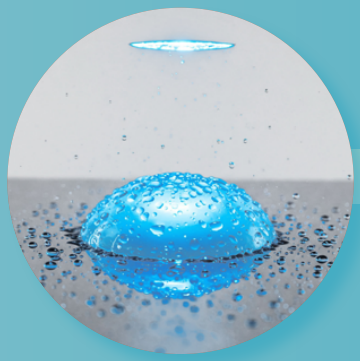
Surface Measurement Systems
World Leader in Sorption Science

# Predict Key Cosmetics Material Properties with Advanced Sorption Characterization



Sorption Behavior & Hygroscopicity

Powder Flow & Cohesion

Surface Energy & Wettability

Vapor Pressure of Fragrances

Absorption & Release Capacity

Cyclability & Stability

Our groundbreaking instruments employ Dynamic Vapor Sorption, Inverse Gas Chromatography, & Breakthrough Analysis to provide comprehensive & precise characterization of solid-state materials, empowering research & enabling scientific breakthroughs in pharmaceutical drug development.

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# Empowering Material Research for World's Leading Cosmetics Developers

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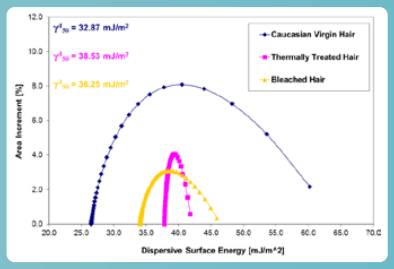
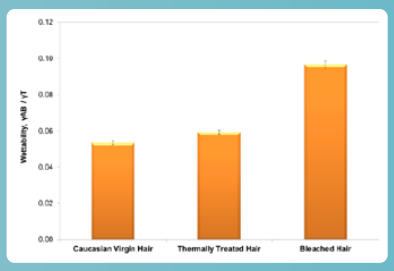
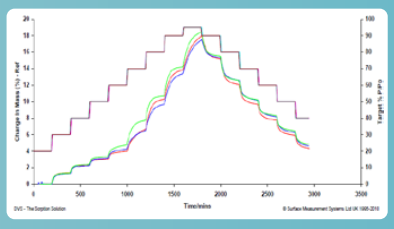
## Our Instruments in Action




*Dispersive surface energy distributions of hair samples*




*Wettability, $\gamma_S^{AB}/\gamma_S^{T}$ profiles for the hair samples.*



*The superimposed moisture sorption and desorption kinetic results for hair samples; undamaged caucasian virgin (red), bleached*

### Case Study 616: Determining of Surface Properties of Human Hair by iGC & DVS

**The Problem:** Hair undergoes surface damage from chemical treatments (e.g., bleaching) and thermal exposure, which alters its physical and chemical behavior. These surface changes affect hydration, adhesion, and product performance, making it essential for the personal care industry to understand and quantify surface energy, wettability, and moisture sorption characteristics of damaged versus untreated hair.

**The Techniques:**
- Dynamic Vapor Sorption (DVS)
- Inverse Gas Chromatography (iGC)

**The Research:** Inverse Gas Chromatography (iGC SEA) and Dynamic Vapor Sorption (DVS) were used to measure surface energy heterogeneity, acid–base properties, and water sorption behavior of virgin, thermally treated, and bleached human hair samples.

**The Results:** Bleached and heat-damaged hair showed increased surface energy, wettability, and water uptake compared to undamaged hair. iGC revealed greater polar interactions in damaged hair due to higher surface heterogeneity. DVS showed significant hysteresis in thermally treated hair, suggesting restricted moisture diffusion. These insights guide formulation of effective hair care treatments.

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