

Krüss Drop Shape Analyzer 100S

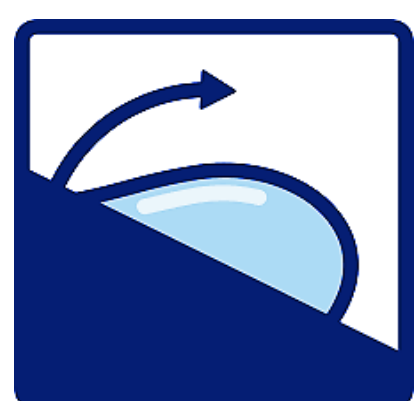
Exploring Surface Tension Properties of Chrome Coated Surfaces

Zahra Ranjbar Nouri*, Dave Matthews and Matthijn de Rooij

Working principle and schematic

The Krüss DSA 100S operates on the principle of contact angle measurement using the sessile drop method, in which a droplet of a known liquid is deposited onto a solid surface. The device can analyze the shape change of the droplet in time, using optical methods to accurately determine the contact angle. Theoretically, the contact angle measured on an ideal surface is described by Young's equation. This angle offers valuable insights into the surface energy, wetting behavior, and interfacial phenomena.

Key features of instrument:



Tilting function

- Roll-off behavior.
- Advancing/receding contact angle of a drop.



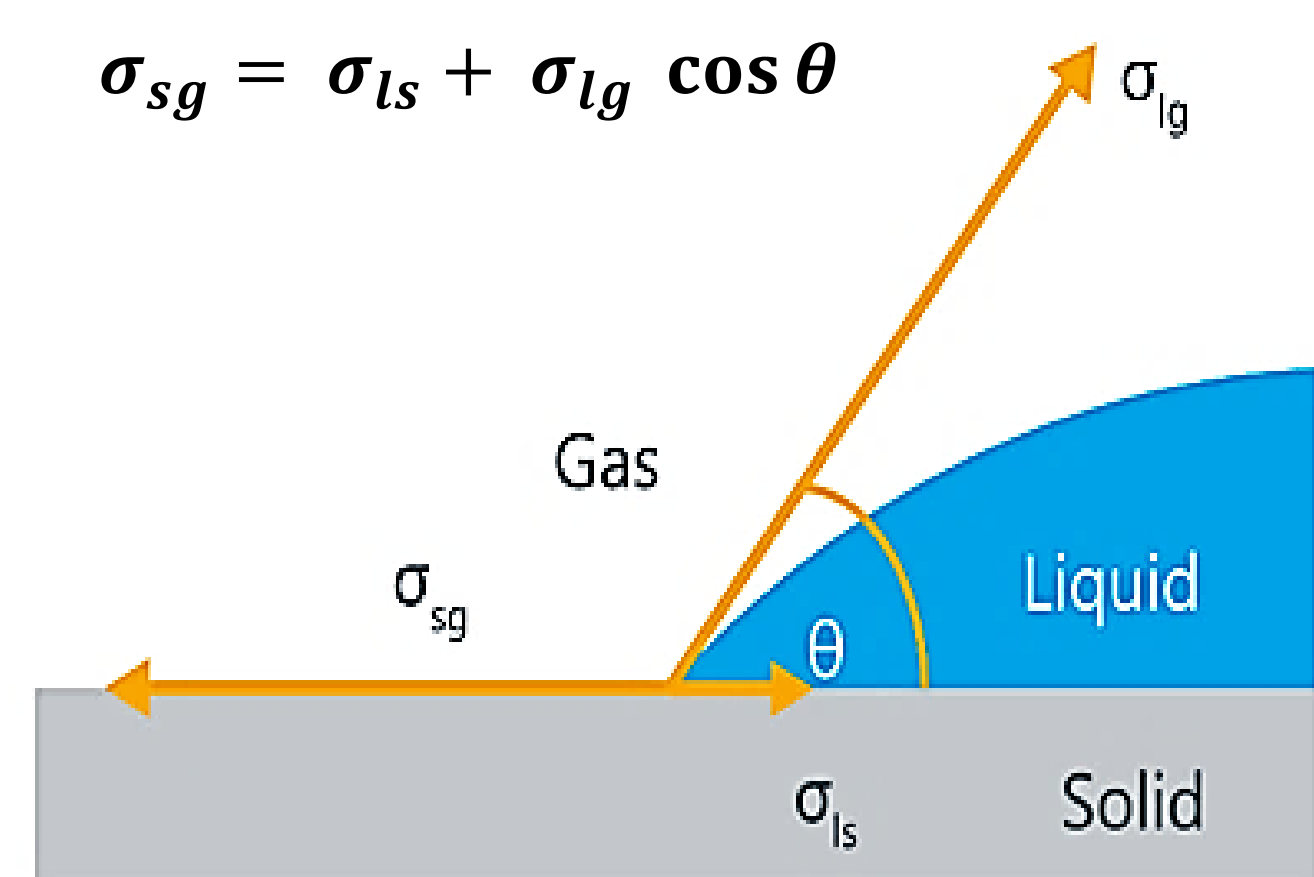
Double-dosing unit

- Extremely fast, fully automatic SFE measurements.
- Eliminating the risk of contamination.



High-temperature dosing unit

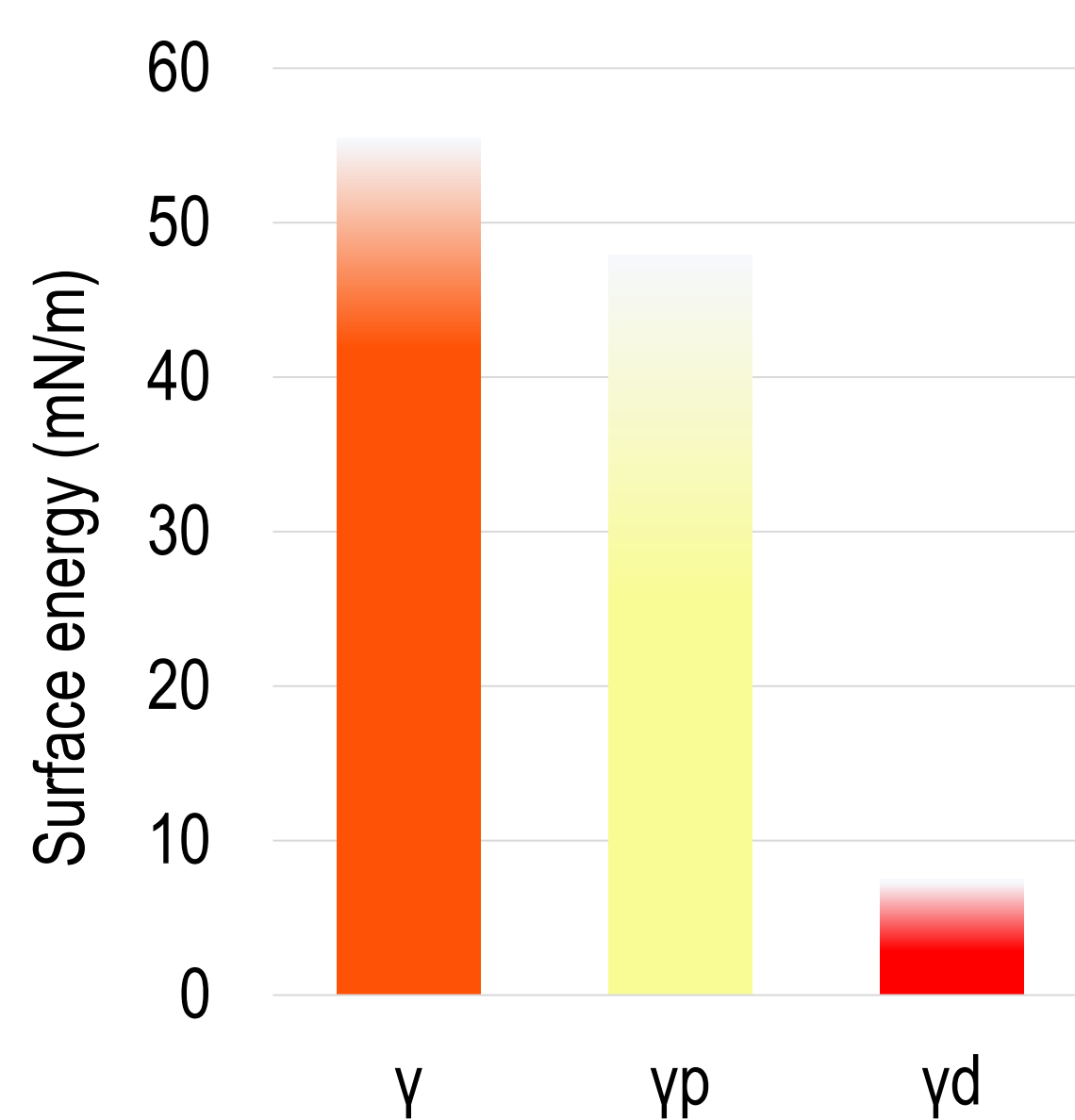
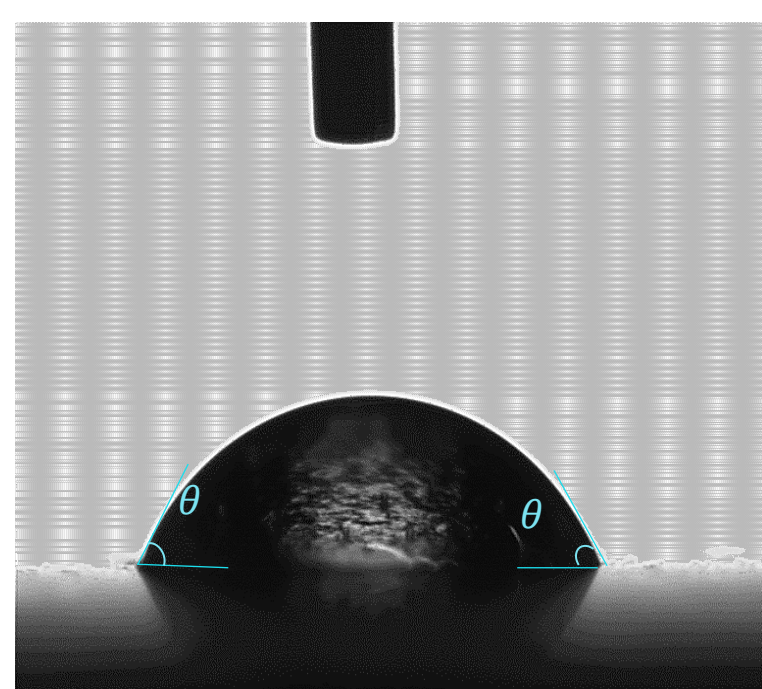
- Analyzing both liquid and solid surfaces at temperatures up to 400°C.



Schematic diagram of contact angle

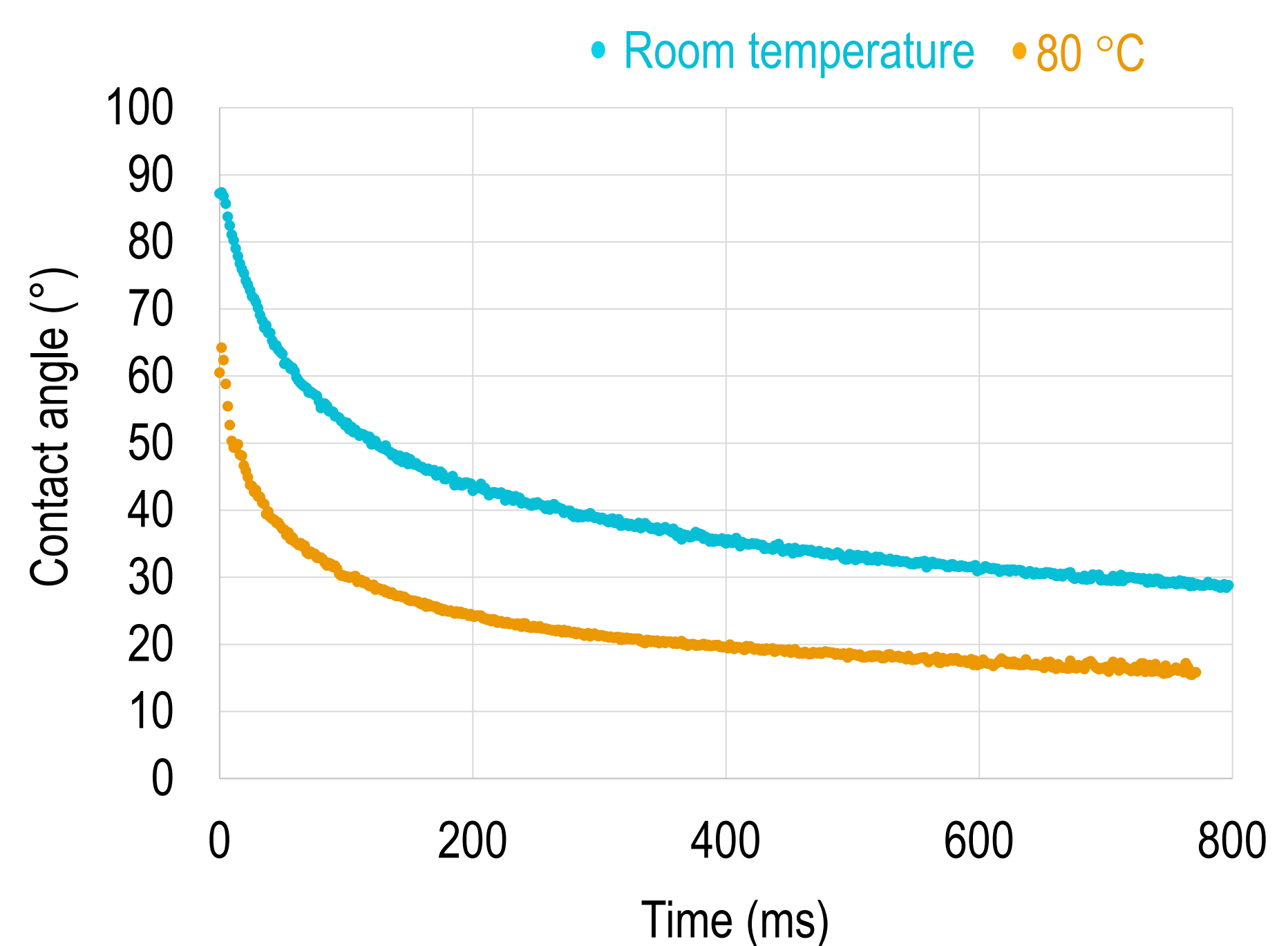
Surface energy and wetting behavior

The surface energy of the hard chrome coating is determined using the static contact angles of three standard liquids, based on the Owens-Wendt-Rabel and Kaelble (OWRK) method:



Surface energy of the chrome surface (γ), including its polar (γ_p) and dispersive (γ_d) components

The instrument's unique feature allows for the precise monitoring of real-time changes in the contact angle of a lubricant oil drop on the hard chrome coating surface at different temperatures:



Wetting behavior of the oil drop on the hard chrome coating surface

UNIVERSITY
OF TWENTE.

Surface Technology
and Tribology

Z. Ranjbar Nouri*

z.ranjbarnouri@utwente.nl