Ebatco Nano
A Bimonthly Newsletter

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Nano Brief

We have moved. With everything back up and running, we are ready to support you at full capacity. Our new address is 7154 Shady Oak Road, Eden Prairie, MN 55344. Please update your address book for us.

Ebatco

There comes a time when a growing company can no longer stay at its current residence. After five years in business, the time has come for Ebatco to find a new facility to better meet the needs of our customers and allow us to grow further as a company. After extensive searching throughout the Twin Cities metro area, a new facility that was literally just across the street from our previous location was selected.

Congratulating floral tribute from Kyowa Interface Science Co. Ltd.

The new facility is expected to be our launching pad for future exponential growth and allow us to better serve our existing and future customers. The expanded lab space is soon to be filled with new analytical and testing instrumentation to augment our existing test capabilities. The spacious conference/presentation rooms encourage valuable business exchanges with customers, technical seminars and training courses. We will be very happy to welcome you and show you our new facility. Please stop by and visit us soon!

Our new Nanomechanical Testing Lab containing our Hysitron TriboIndenter and CSM Scratch Tester.

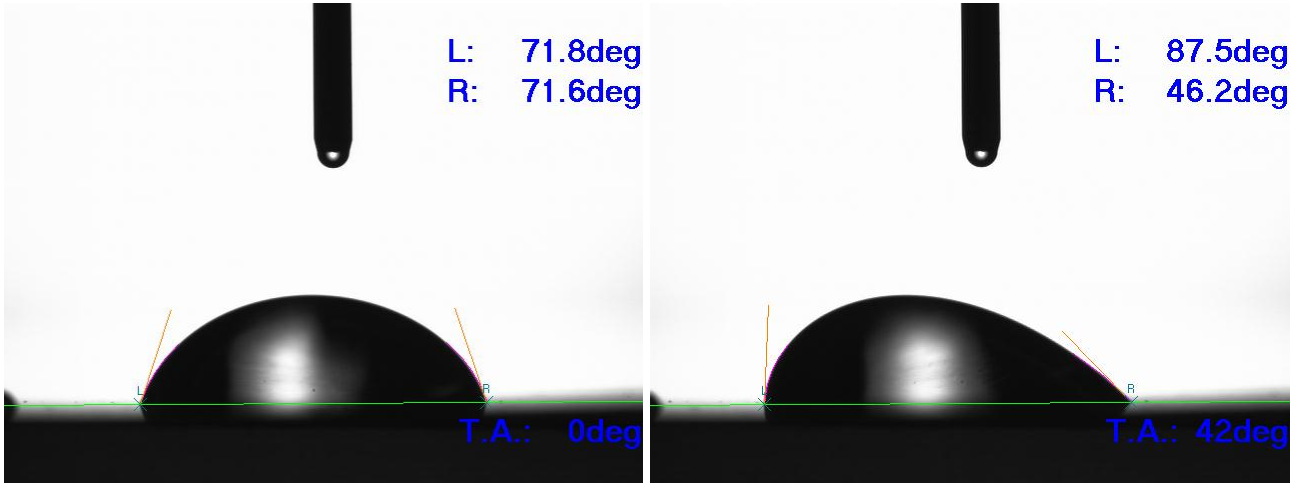
Case Study

Contact angle measurements characterize a surface's wettability by placing a liquid droplet on a surface and measure the angle formed at the liquid and solid interface. Typically, a surface would only form one contact angle with a particular liquid at equilibrium. In practice, however, a surface can form a range of contact angles due to surface features and chemistry or dynamic interactions between liquid and solid surface. This range in contact angle is referred to as contact angle hysteresis. Several methods exist to quantify the contact angle hysteresis of a solid surface. One popular method is the sliding angle method employed by camera-based contact angle meters such as the Drop Master series manufactured by Kyowa Interface Science. Contact angle meters, like our Kyowa DM-701, can be equipped with a rotating base unit that rotates the entire measurement unit from 0° to 90°. The advantage of rotating the entire measurement unit at once is that it eliminates the disturbance of light intensity change at the measurement point and the associated droplet image distortion to increase the measurement accuracy.

The sliding angle method characterizes a sample by measuring the changes in contact angle of a droplet on a surface as the base unit

rotates. When the sample stage changes its angle relative to the horizontal plane, gravitational forces pull the droplet until it overcomes the adhesive forces between the droplet and the solid surface. The angle between the stage plate and the horizontal plane at the movement where the droplet first slides is defined as the sliding angle or roll-off angle. The corresponding contact angle at the front end of the droplet is the advancing angle while the contact angle at the trailing end is the receding angle. During the sliding angle test, the dispenser tip is not in contact with the droplet. This removes any potential tip influence on the measurements of the advancing and receding angles. The sliding angle method provides sliding angle and work of adhesion data in addition to the advancing and receding angles. The sliding angle itself is useful in certain applications such as automotive windshield and rooftop design. The work of adhesion between a solid and liquid is helpful to characterize liquid spread, removal, flow in applications such as spin coating, cleaning, painting, microfluidics, etc.

As shown below, a water droplet was placed on a stainless steel plate for sliding angle analysis. As the base unit rotated, the contact angle measured on the left side (front end) of the droplet increased while the contact angle on the right side (trailing end) decreased. Eventually, the base unit tilt angle reached a point where the water droplet slid from its initial position. This point corresponded to the sliding angle and at this point, the advancing and receding angles were determined. Should you have a need to characterize the liquid and solid interaction dynamically? Try out the sliding angle method!



Water droplet on a stainless steel plate at the start of measurement (left) and at the sliding angle (right).

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