



Ebatco Nano

A Bimonthly Newsletter

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Nano Brief

In the upcoming months, we will have an exhibition booth at several upcoming seminars, society meetings and tradeshow. If you are attending any of the following events:

- February 26th, ASM MN Chapter Annual Seminar: Materials for Medical Devices, Hennepin Technical College, Brooklyn Park, MN
- February 28th, Academic & Industry Nanotechnology Conference, St. Cloud State University, St. Cloud, MN
- March 4th-6th, **Booth #509**, TMS Annual Meeting & Exhibition, Henry B. Gonzalez Convention Center, San Antonio, TX
- March 18th -21st, **Booth #537**, Pittcon, Pennsylvania Convention Center, Philadelphia, PA **representing Kyowa Interface Science, Co. Ltd.*
- April 30th-May 1st, **Booth #108**, International Conference on Metallurgical Coatings and Thin Films, Town & Country Convention Center, San Diego, CA

Please stop by our booth to discuss the incredible nano world of nanomaterials, nanodevices, nanoinstruments, and nano/micro scale surface characterization with our staff scientists. We hope to see you there!

Ebatco

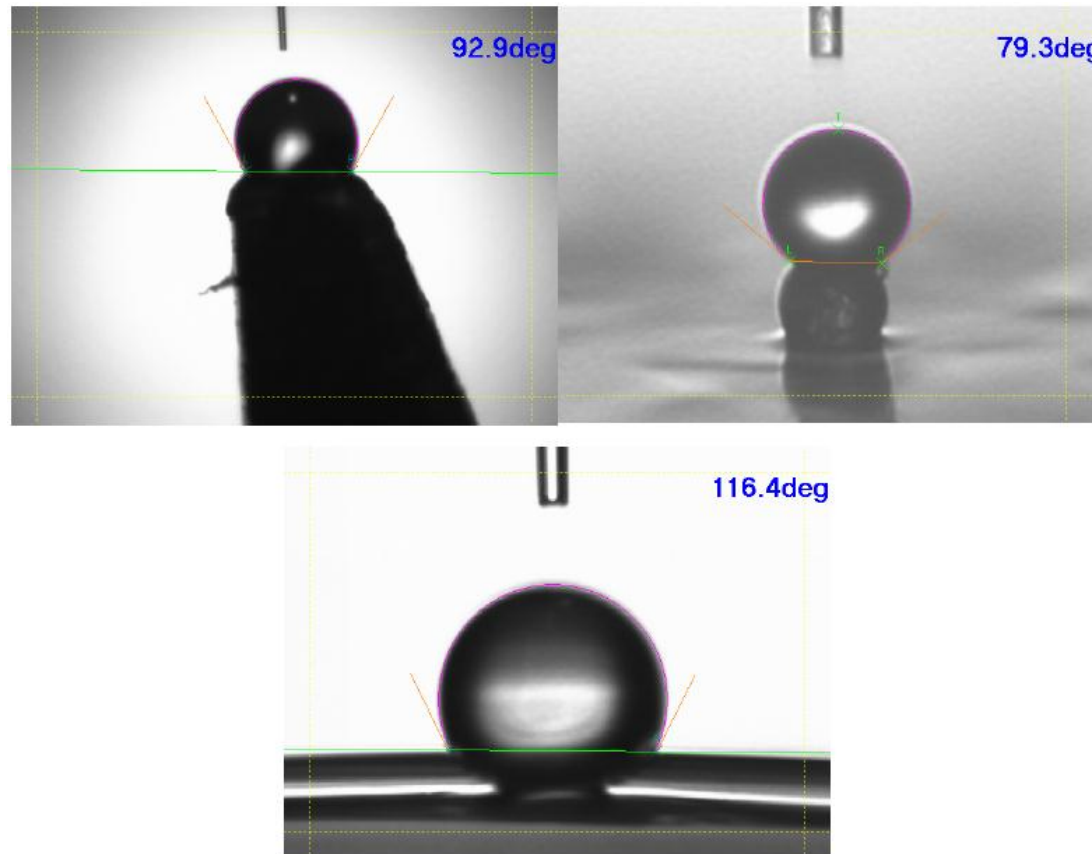
Joining all of us on the Ebatco team is June Li. She is a graduate of Rose-Hulman Institute of Technology in Indiana with a bachelor's degree in Biomedical Engineering. With her solid background and in-depth knowledge on biomedical engineering, she is expected to further strengthen Ebatco's nanobio presence and to provide prime support to our customers in the biomedical industries. Welcome onboard, June!

Case Study

The micro contact angle meter we have in our NAT Lab is specially designed for the pioneers in the micro/nano fields. The instrument is equipped with a unique capillary liquid dispensing system that has inner diameters of 5, 30 and 50 μ m, for making a liquid drops picoliter to nanoliter in volume. In addition, the instrument comes with orthogonal vertical and horizontal high magnification optics for accurately placing and measuring such small drops on micrometer features, and CCD cameras with high capturing speeds of 60 frames

per second for studying dynamic characteristics of interaction between micron size liquid droplets and solid surfaces.

The captured images shown below exemplify the types of surfaces that can be tested with the micro contact angle meter. Using the vertical high magnification optics, a micron-sized droplet was accurately placed on a small hydroxyapatite coated Ti post on an orthopedic implant, a single Al_2O_3 particle, and a polymeric fiber used in baby diaper products. Then the software determined the contact angles using one of several curve fitting routines based on the captured image of the cross-sectional profiles of the sessile drops. Please note that a curvature correction routine standardized in the measurement software has been applied to the contact angles measured on the Al_2O_3 particle. The actual contact angles are much smaller than those appeared on the images when flat baselines are used.



Captured droplets used for microcontact angle analysis on a 140 μm hydroxyapatite coated Ti post (top left), a 30 μm Al_2O_3 particle (top right) and a 20 μm polymer fiber (bottom).

In synergy with its sensitivity of detecting monolayer molecules, contact angle measurement at microscale has been proven to be an ideal and indispensable tool to study surface properties of single particles, filaments, fibers, medical lead and guide wires, patterned organic light emitting display, microcircuits, microfluidic channels, micropatterned surfaces, lotus effect, and high-speed ink-jet printing. The high speed capturing capability of the instrument is deemed advantageous in determining strong dependency of contact angles on time at millisecond intervals. The recorded feature-rich dynamics of micron size drops is valuable for investigating sensitive surface chemistry, vapor evaporation and adsorption, surface contamination and cleanliness, wettability, hydrophilicity and hydrophobicity changes at micro/nano scales.

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