Ebatco Nano
A Bimonthly Newsletter

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Nano Brief

In the upcoming months, we will be exhibiting at several upcoming conferences. If you are attending either of the following events:

- September 19th, MN AVS Annual Symposium, CEC Center, University of Minnesota, St. Paul, MN
- September 29th-October 4th, FACSS SciX 2013, Hyatt Regency Milwaukee and Delta Center, Milwaukee, WI, *representing WITec Instruments Corp.*
- October 7th-9th, BioInterface 2013, Hotel Sofitel, Bloomington, MN, *representing Kyowa Interface Science Co., Ltd.*

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

Dr. Gang Pu is a new addition to the Ebatco team. Dr. Pu received his undergraduate degree (Metallic Engineering) from Tianjin University and Masters (Materials Physics and Chemistry) from Tsinghua University in China. He got his Ph.D. (Materials Science and Engineering) from the University of California-Davis, and followed with a post-doctoral appointment at the University of Minnesota-Twin Cities. He has experience in synthesizing biodegradable pressure sensitive adhesive and hot-melt adhesive systems; modification smart coatings such as self-cleaning coating; anti-oil-fouling coating and optical switching adhesives; characterization of the mechanical, surface, biocompatibility and performance properties of various materials; adsorption and diffusion behaviors of polymer interfaces and crystal growth control through the biomineralization process.

Dr. Pu has more than 20 research publications, and has worked in a wide range of fields including metals, ceramics, polymers, nanocomposites, colloids, surfactants and adhesives. Dr. Pu will be expanding research and development at Ebatco, as well as assisting with customer projects and developing training materials based on Ebatco's wide range of analytical tools.

Case Study

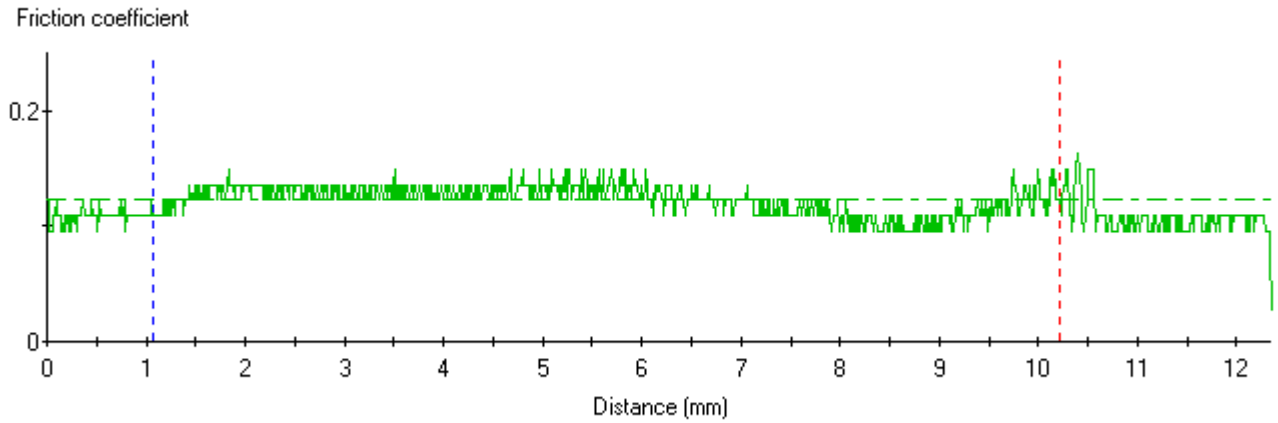
Friction is a measure of a surface's resistance to motion. When two surfaces are rubbing against each other, friction acts as the force to prevent the two surfaces from moving in a given direction. Continued relative motion leads to material loss or wear of the surface and

its friction counterpart. Over time, a surface will degrade to a point that renders the surface unusable for its designed application. Altering the surface chemistry can change the friction properties to better suit the application needs and help to prolong the material's useful life.

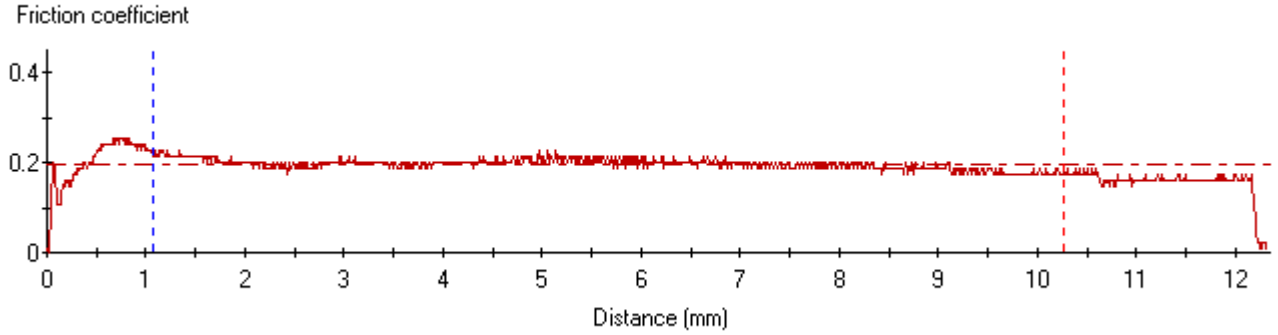
The TS-501 Triboster, manufactured by Kyowa Interface Science Co., Ltd., is capable of measuring both static and kinetic friction coefficients of a material surface in a single pass or multiple passes under dry or lubricated conditions with temperature control from room temperature to 180ºC. The high sensitivity friction transducer and low loads employed by the TS-501 allow for softer materials like polymers, fabrics and thin films to be tested with ease and accuracy. The velocity of the stage is automatically controlled by user input values from 0.02 mm/s to 100 mm/s.

Most of the disposable contact lenses are made of extremely soft hydrogels with significant amount of water content. Wearing contact lenses is becoming trendy for people whether it is for cosmetic, corrective or therapeutic reasons. In addition to many designed functionalities of the contact lenses, wearing comfort is a key factor to be well controlled by the contact lens designer. One of the aspects of the wearing comfort is the friction between eyelid and the contact lens.

As shown below, two different kinds of commercially available contact lenses from Johnson & Johnson Vision Care, Inc. were tested for friction using the TS-501. The first kind of contact lens tested was 1-Day Acuvue TruEye disposable contact lens. The second kind of contact lens was Acuvue Oasys Hydraclear Plus disposable contact lens. Both kinds of contact lenses were tested under the same conditions and parameters sliding against glass slide in saline contact lens solution. From the results, it is obvious that the static and kinetic friction coefficients for the two kinds of contact lenses are different. The different friction coefficients would result in different wearing comfort for people.



Friction coefficient as a function of sliding distance for the 1-Day Acuvue TruEye contact lens against glass slide in saline contact lens solution.



Friction coefficient as a function of sliding distance for the Acuvue Oasys with Hydraclear Plus contact lens against glass slide in saline contact lens solution.

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