http://www.SurForceLLC.com
SurForce@SurForceLLC
(805) 722-9316

Brief description of the SFA-FECO technique, and its unique features

The SFA when coupled with the FECO optical technique allows one to measure;

(i) the force, F, between two surfaces,

(ii) the absolute separation distance, D, between two surfaces to 0.1 nm – directly, independently and unambiguously, that is, even when they are well-separated and not experiencing each other's force fields,

(iii) the local shape profiles / elastically deformed geometry of the surfaces in the interaction zone, for example, the local radius of curvature R, which is required for transferring force-distance function, $F(D)$, to the surface energy-distance function, $E(D)$, and adhesion/surface energy, $\gamma = \frac{1}{2}E(0)$,

(iv) the *exact* contact area,

(v) the refractive index of the material (adsorbed film or trapped liquid) in the gap, which allows determination of the amount of material between the surfaces, as well as any capillary liquid bridge between them (from the discontinuities in the refractive index), and

(vi) dynamic or non-equilibrium interactions, where an intermolecular force changes (relaxes, equilibrates, increases, decreases, etc.) with *time*; and can distinguish this from thermal drift or viscous forces. For example, if a chemical reaction is occurring that results in the slow dissolution of one or both of the surfaces, the SFA-FECO technique can follow this unambiguously even if the dissolution (or adsorption/deposition) rate is as slow as ångstroms per day.

All of these features make the SFA technique unique, and we continually work to further extend the versatility of the SFA by introducing new surface characterization techniques via attachments that can be fitted to the SFA.

The basic unit and suite of optional attachments make the SFA a truly "multimodal" instrument capable of simultaneous quantitative measurements of both physical (including electrical) and chemical interactions between two surfaces close together from the macro-, through the micro- and down to the subnano-scale, and under both static and dynamic conditions.