Excellence in Surface Plasmon Resonance

BioNavis

Biomaterials

Measurements of hydrogels without water artifacts!

Key questions MP-SPR can answer in research of biomaterials:

- How does protein X interact with coating Y?
- How thick is the coating?
- When does the responsive coating change its conformation?
- How reproducible is the coating?
- Which coating offers best gas/moisture/antireflective barrier?
- What is the release rate of drug X from material Y at pH 6?

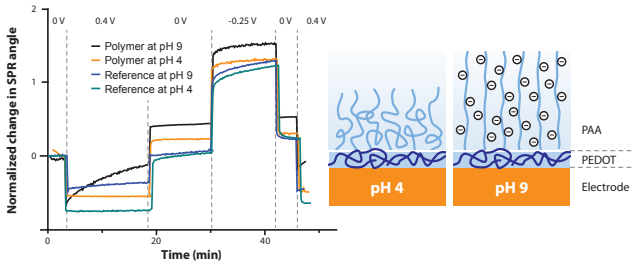
The most sensitive instrument for real-time label free surface interactions and layer properties!

www.bionavis.com/soft-materials

Why choose MP-SPR for characterization of biomaterials?

The most sensitive instrument for real-time adsorption kinetics on surfaces

Due to its plasmonic principle, MP-SPR is the most sensitive measurement for kinetics on surfaces. This is important in real-time measurements of adsorption kinetics, swelling and release.

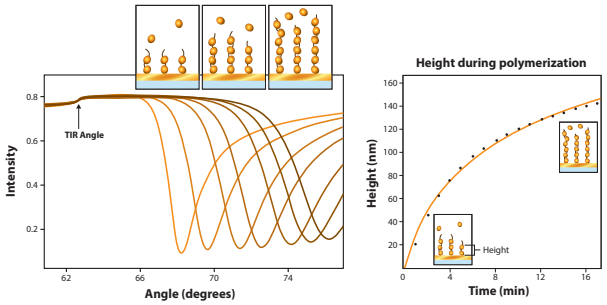


Measure also thick samples

MP-SPR can measure even 20 µm thick samples. MP-SPR measurements can be performed at different pH, temperature (15 to 45 °C), electric potential and flow-rate. The measurements do not require vacuum.

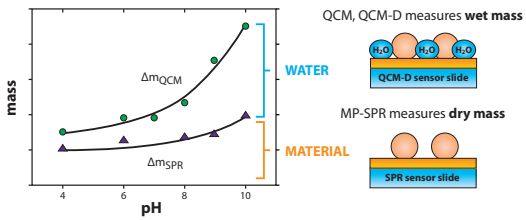
Thickness and refractive index solved simultaneously

Thanks to our multiwavelength configuration with scanning angular range of almost 40 degrees, MP-SPR is capable of acquiring enough information to solve thickness and refractive index of the layer simultaneously using LayerSolver™. This is possible even up to microns thick films.



No water artifacts

While QCM (quartz crystal microbalance) instruments suffer from hydration effects as they measure wet mass, MP-SPR is an optical method, and therefore provides desired measurement of adsorbed molecules without solvent in interfacial layers (dry mass).



MP-SPR can also be used for measurement of swelling and hydration.

Swelling measured *in situ*

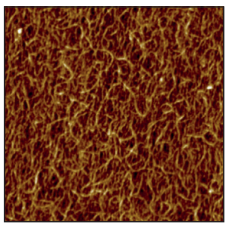
Traditional SPR is developed to work in liquid. On the other hand, traditional ellipsometers work the best in air. Thanks to its goniometric configuration, MP-SPR works in both. This allows measurements from dry to wet state with the same configuration.

Cross-validation with microscopy and modelling is possible

MP-SPR with electrochemistry, fluorescence or another specialty flow-cell allows for validation of measurements *in-situ*.

Thanks to its oil-free operation, the same sample can be measured *ex-situ* with AFM, SEM or other techniques.

Results from MP-SPR are absolute and therefore can be directly related to physical properties, validated by established theoretical models, and can be confirmed also analytically.



Recommended MP-SPR Navi™ instrument for measurements of biomaterials:

200 OTSO **400 KONTIO** **210A VASA** **220A NAALI** **420A ILVES**

Further reading:

AN#161 Polymerization kinetics
AN#159 Vapour induced changes in polymers
AN#158 Cellulose nanocrystals dispersibility
AN#150 Organophosphonates adsorption
AN#149 Polymer characterization - adsorption studies and layer thickness
AN#136 Stimuli-responsive polymer monitored with MP-SPR
AN#128 Thickness and refractive index calculations of transparent films
AN#111 Polyelectrolyte multilayers formation

Selected publications:

Strongly Stretched Protein Resistant PEG brushes
(G.Emilsson et al., ACS Appl. Mater. Int, 2015)

Electrical stimuli responsive coatings
(Malmström et al., Macromolecules, 2013)

Thickness and refractive index characterization by MP-SPR
(Granqvist et al., Langmuir, 2013)

Affibody conjugation to cellulose and bioseparation
(H.Orelma, RCS Advances, 2014)

Nanocellulose characterization and interfacial water expulsion
(Vuoriluoto et al., Journal of Physical Chemistry, 2015)

Monitoring of polymerization kinetics and morphology changes of brushes
(Emilsson et al., Applied Surface Science, 2017)

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