APPLICATIONS OF IMAGING ELLIPSOMETRY AND BREWSTER ANGLE MICROSCOPY IN BIO-FUNCTIONALIZATION AND SENSING – AN OVERVIEW

Peter H. Thiesen[a]

[a)] Accurion GmbH, Stresemannst. 30, 37079, Göttingen, Germany

A homogenous functionalization of equivalent surfaces and an accurate patterning of arrays is the desired case in bio functionalization and sensing, but the experimental reality is often different. Uncoated areas are frequently contaminated with remnants from coating of different treated sample areas (Fig. 1) or with additives of the coating process. The doughnut effect and similar issues can occur in case of drying. In some cases particles are formed by aggregation or by competitive reactions to the grafting as is frequently the case for silanization with trifunctional silanes. From the point of view of biomolecular interactions, model membranes like supported bilayers are of increasing interest. In case of mixed lipid layers, phase transition can take place forming rich and pure domains. In this case an overall averaging method is misleading. Perhaps the initialization of biofouling can be considered as a localized bio functionalization.

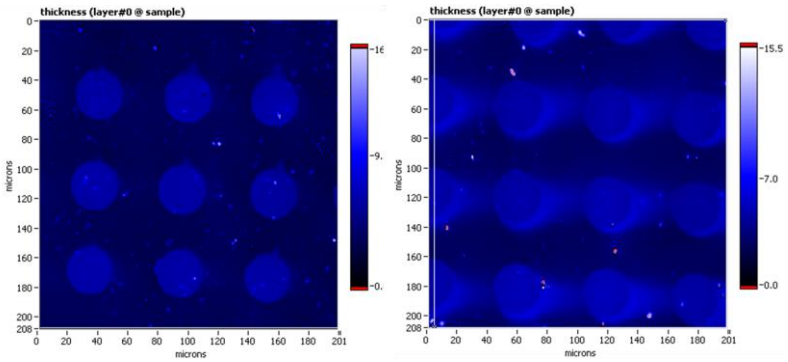

Fig. 1. Protein array on Si-wafer after washing, measured at 658 nm (laser)

The mentioned scientific questions require very sensitive, label free detection methods with a microscopic lateral resolution. The contributed paper will give an overview how Imaging Ellipsometer, Brewster Angle Microscopy and imaging Surface Plasmon Resonance Enhanced Ellipsometry (i-SPREE) can contribute in solving these questions.

Keywords: Imaging ellipsometry, Brewster angle microscopy, i-SPREE, LB-films, supported bilayers, biomolecular interaction