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# Simultaneous characterization of physical, chemical, and thermal properties of polymeric multilayers using infrared spectroscopic ellipsometry.

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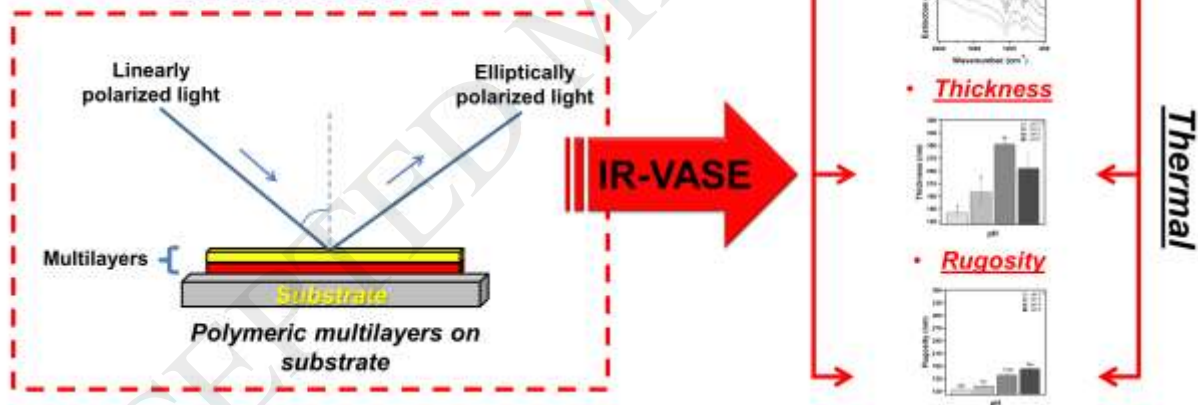
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## GRAPHICAL ABSTRACT

### IR-VASE Technique: Simultaneous characterization



## Abstract

In this study, multilayered films of polyethylenimine/poly (sodium-p-styrene sulfonate) (PEI)/(PSS) and type I collagen/heparin sodium (COL)/(HEP) were fabricated using the layer-by-layer technique, and fully characterized using Infrared Variable Angle Spectroscopic Ellipsometry (IRVASE) to simultaneously analyze the chemistry, thickness, and roughness of the multilayers with respect to changes in pH of the washing solution, and changes in temperature. Film topography and Young's modulus were obtained by atomic force microscopy (AFM) and nanoindentation. Our results show that with IRVASE it is possible to analyze the thickness of the multilayers prepared using a washing solution of pH 5, obtaining values of 71.7 nm and 40.3 nm for three bilayers of PEI/PSS and COL/HEP, respectively. Film roughness varies between multilayer systems,

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