Ellipsometer J.A. Woollam M-2000VI

Spectroscopic ellipsometry is based on the measurement of a polarised white light beam reflected from a coated flat surface. It allows to determine the optical constants and thickness of thin films. Some applications are found overleaf. Fig. 1 shows our ellipsometer M-2000 from J.A. Woollam.

Technical data:

Wavelength range	370 – 1690	nm	
Wavelength resolution	1.6	nm	(VIS)
	3.6	nm	(IR)
Goniometer motorised	45 – 90	°	
Spot size	150	µm	(with focusing lens, short axis)
Scan range	100 x 100	mm^2	
best resolution (film thickness)	0.05	nm	
typical measurement time	4	s	

Fig.1: Ellipsometer M-2000VI (J.A. Woollam, USA).

Applications

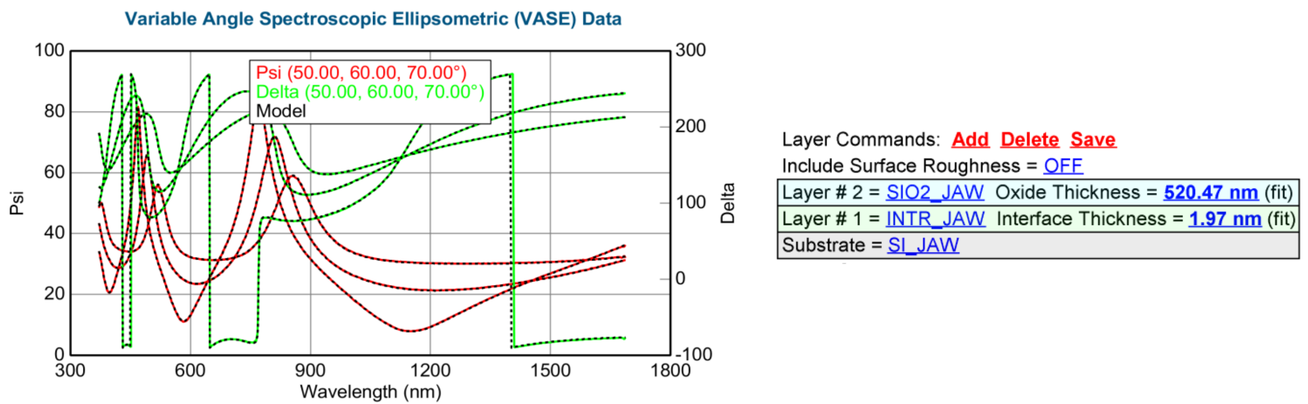


Fig. 2: Determination of SiO_2 layer thickness on top of a Si-wafer, based on the ellipsometric measurements at three angles of incidence. Dotted lines are the best fit model results.

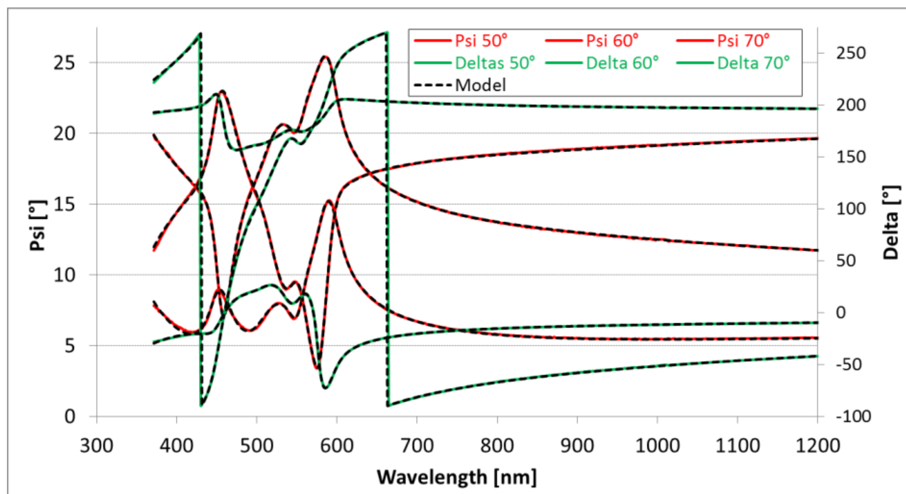
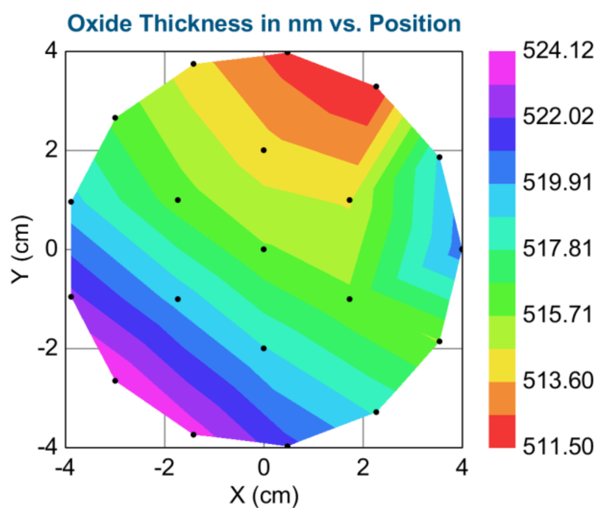


Fig. 3: Spectroscopic ellipsometry data (full lines) of a Cyanine layer and corresponding best fit results using a four-oscillator model (dotted lines).



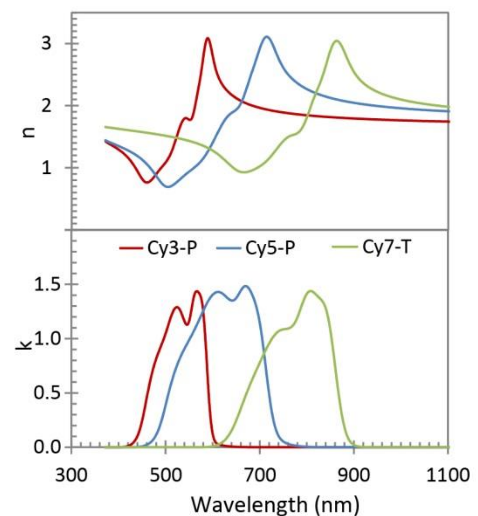


Fig. 4: Variation of layer thickness across the Si-Wafer.

Fig. 5: Optical constants of three Cyanine layers.