SEA regression report summary

Sample ID
001b 70° 2

Details	
Software and regression log	
Software about	Semilab - Spectroscopic Ellipsometry Analyzer - SEA
Software version	1.7.1
Officially licensed to	MIT
Operator	operator
Date and time of regression	14-07-2021 13:48
Comments	

Layer structure	
Overview	

Optical model	
Phase 2	ITO + void
Diffusion	
Phase 1	ITO
Dispersion law	Tauc-Lorentz
	Drude

Regression results

Measurement information				
Measurement file path	C:\Users\emmabat\ito-si\001b.smdx			
Angle of Incidence	70°			
Regression details				
Regression 1 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	70°			
Fit to	<n>, <k>			
Angular Aperture	0°			
Fit algorithm	LMA			
Results				
Parameters	Value	Fitted	2 σ confidence limit	Unit
Model				
AOI Shift	0			°
Angular Aperture	0			°
Phase 2 (ITO + void)				
Thickness	4.102	X	0.15659	nm
Depolarization coefficient	0.33333			
Concentration 1	0.5			
Concentration 2	0.5			
Phase 1 (ITO)				
Thickness	129.488	X	0.24611	nm
A (eV)	289.43854	X	25.34007	eV
E0 (eV)	9.42545	X	0.19657	eV
C (eV)	40.66398	X	4.1517	eV
Eg (eV)	2.65721	X	0.014226	eV
E_p (eV)	0.97054	X	0.0085449	eV
E_Γ (eV)	0			eV
Eps_inf	0			
Derived parameters	Value			
Phase 2 (ITO + void)				
n @ 632.8 nm	1.4995			
k @ 632.8 nm	0			
Phase 1 (ITO)				
n @ 632.8 nm	2.0568			
k @ 632.8 nm	0			
Substrate (si)				
n @ 632.8 nm	3.8811			
k @ 632.8 nm	0.0195			
Drude derived parameters	Value			Unit
Phase 1 (ITO)				
Conductivity (S/m)	∞ ± NaN			S/m
Resistivity (mΩ.cm)	0 ± NaN			mΩ.cm
Resistance (Ω/sq)	0 ± NaN			Ω/sq
N type dopant concentration (at/cm3)	1.7079E+20 ± 3.0073E+18			at/cm3

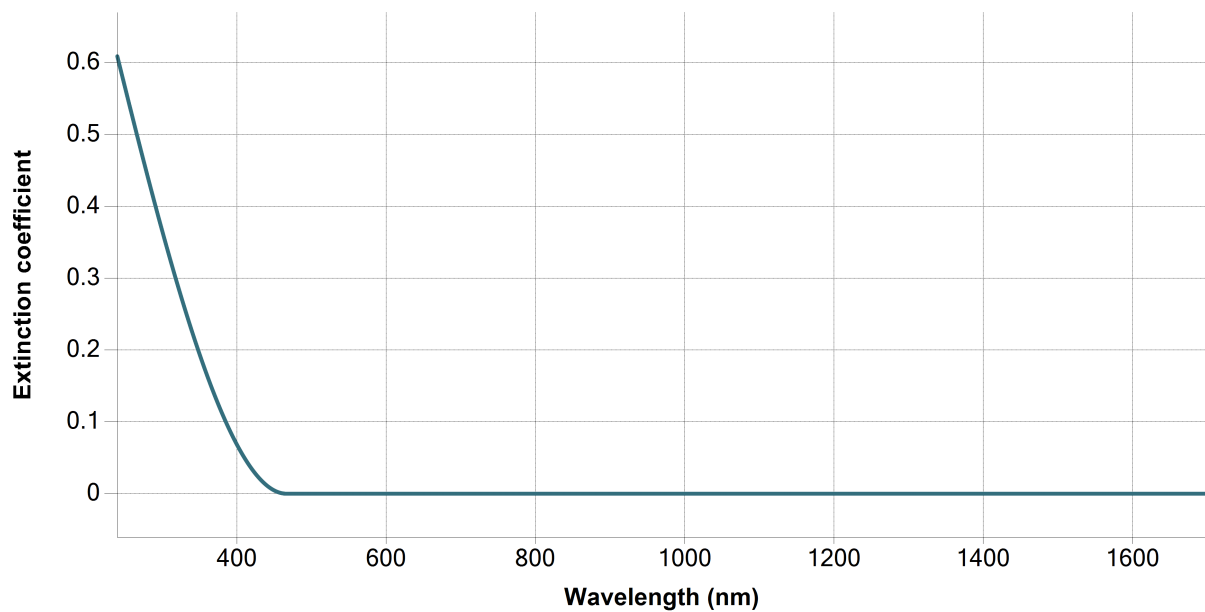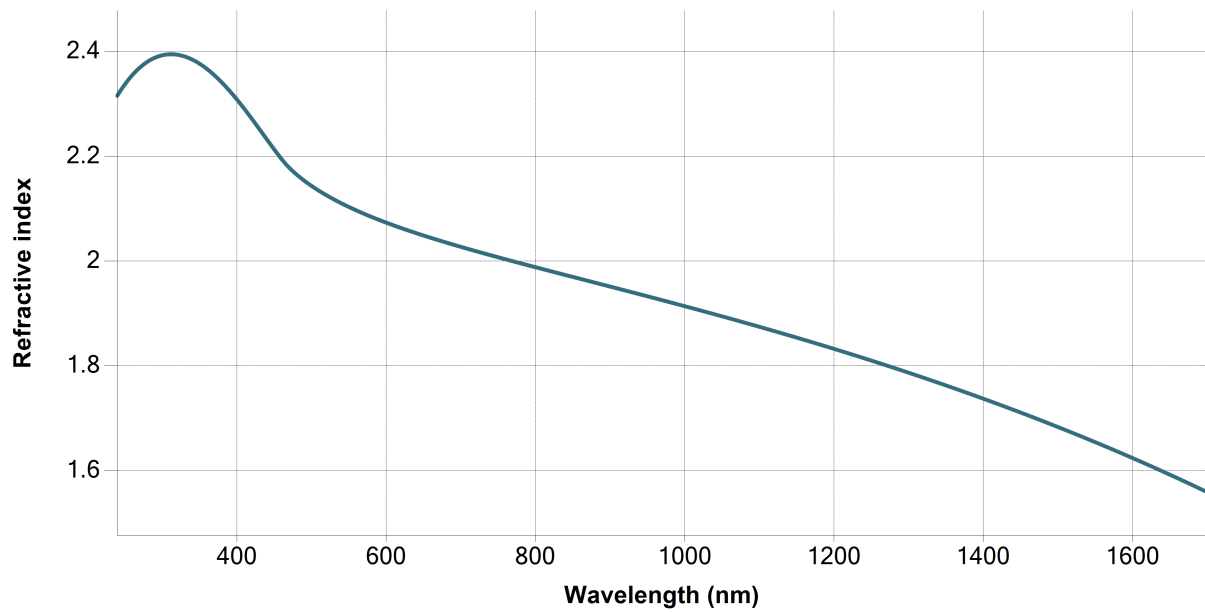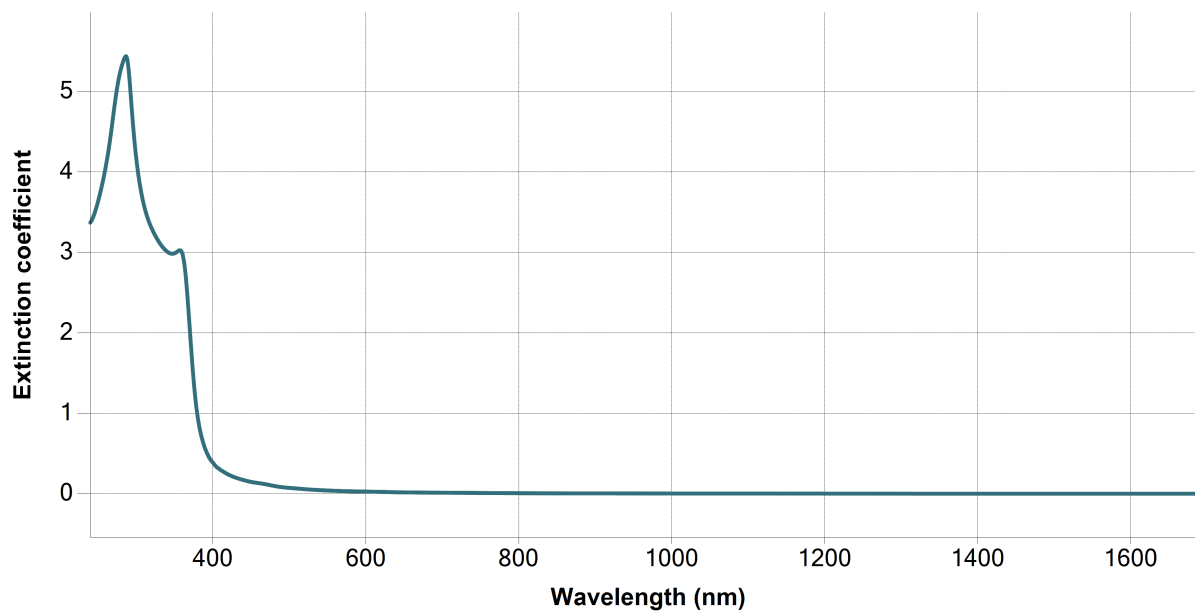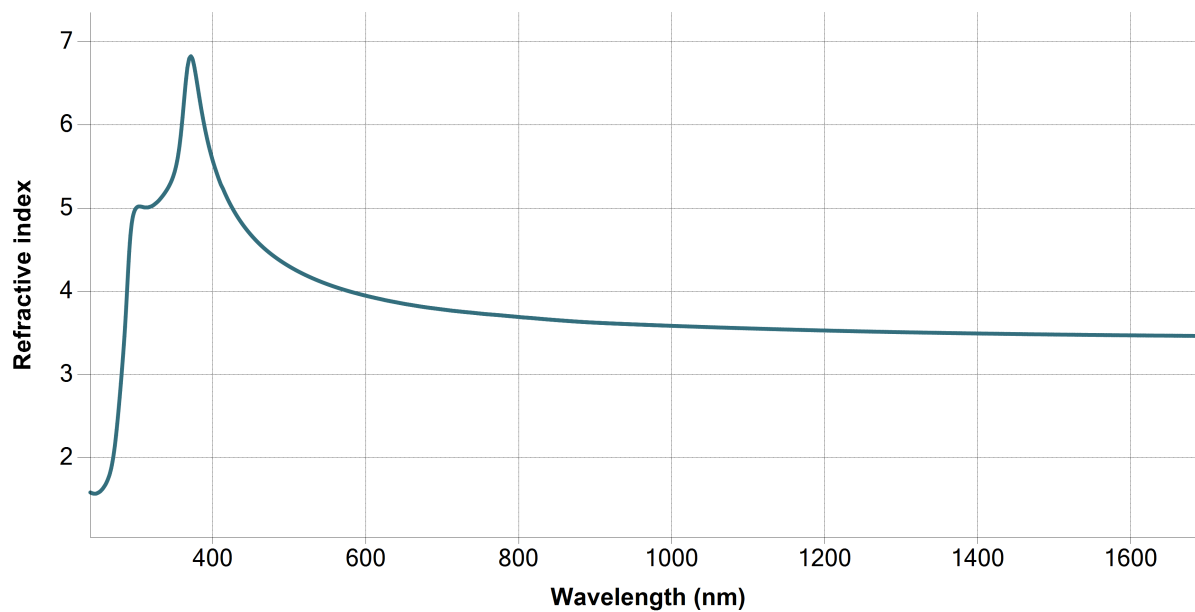|		
P type dopant concentration (at/cm3)	2.5277E+20 ± 4.4508E+18	at/cm3
N type dopant mobility (cm2/Vs)	∞ ± NaN	cm2/Vs
P type dopant mobility (cm2/Vs)	∞ ± NaN	cm2/Vs
Fit quality		
R^2	0.99679	
RMSE	0.05341	

Regression graphs
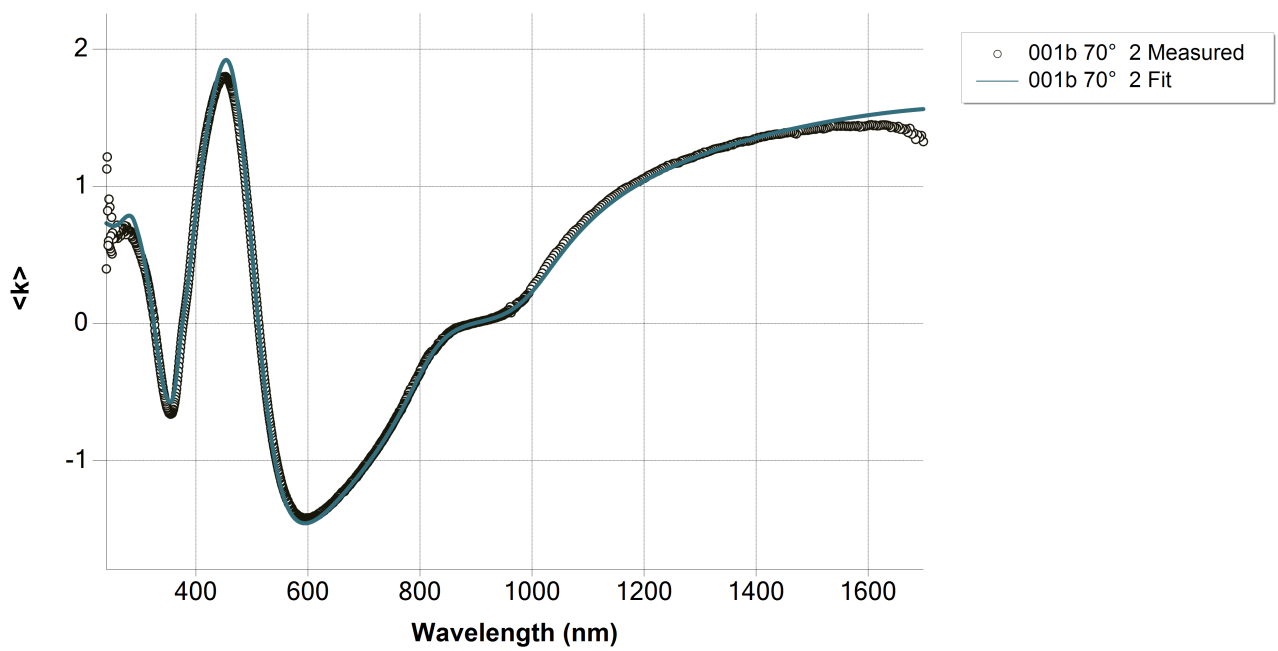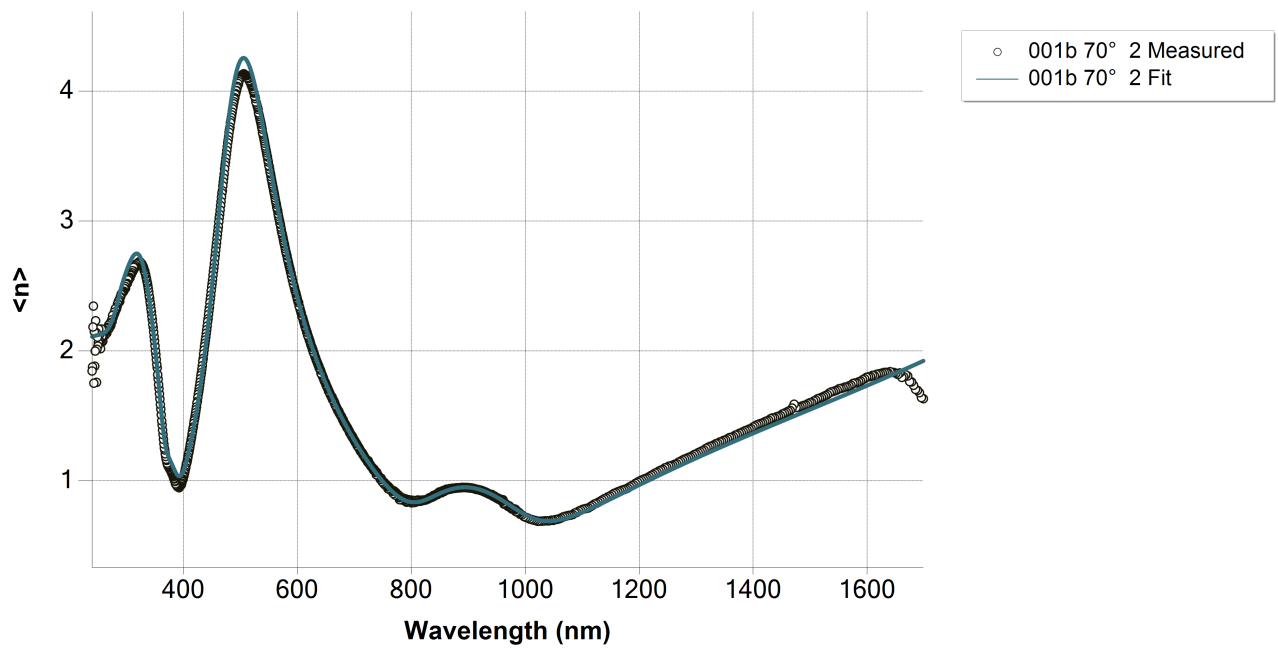
Phase 2 (ITO + void) - Dispersion graphs
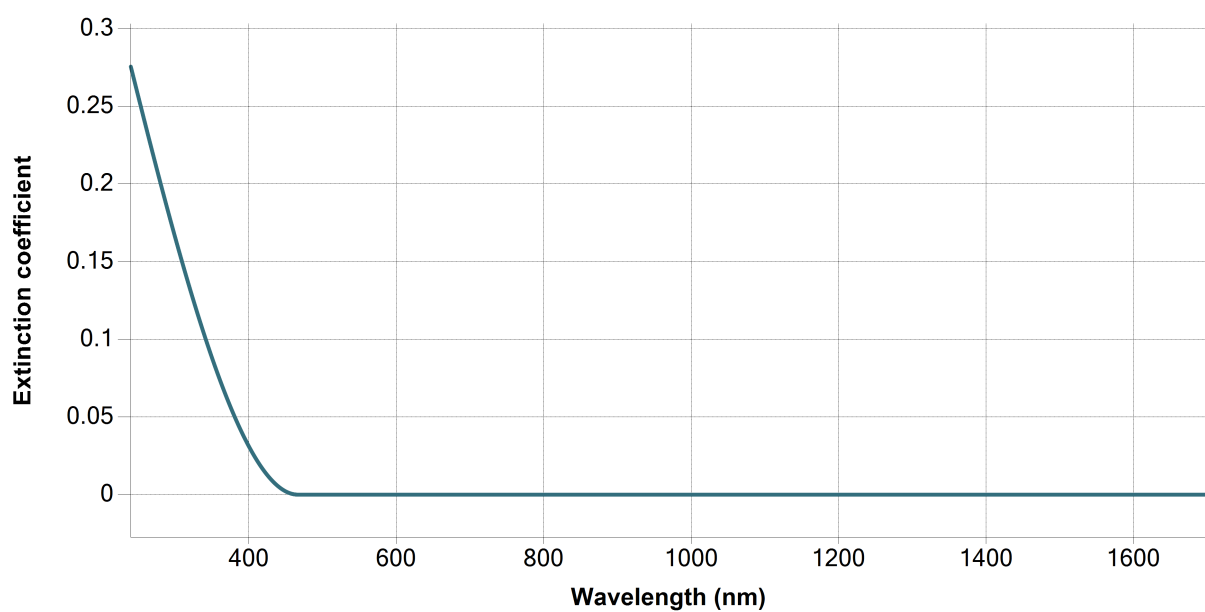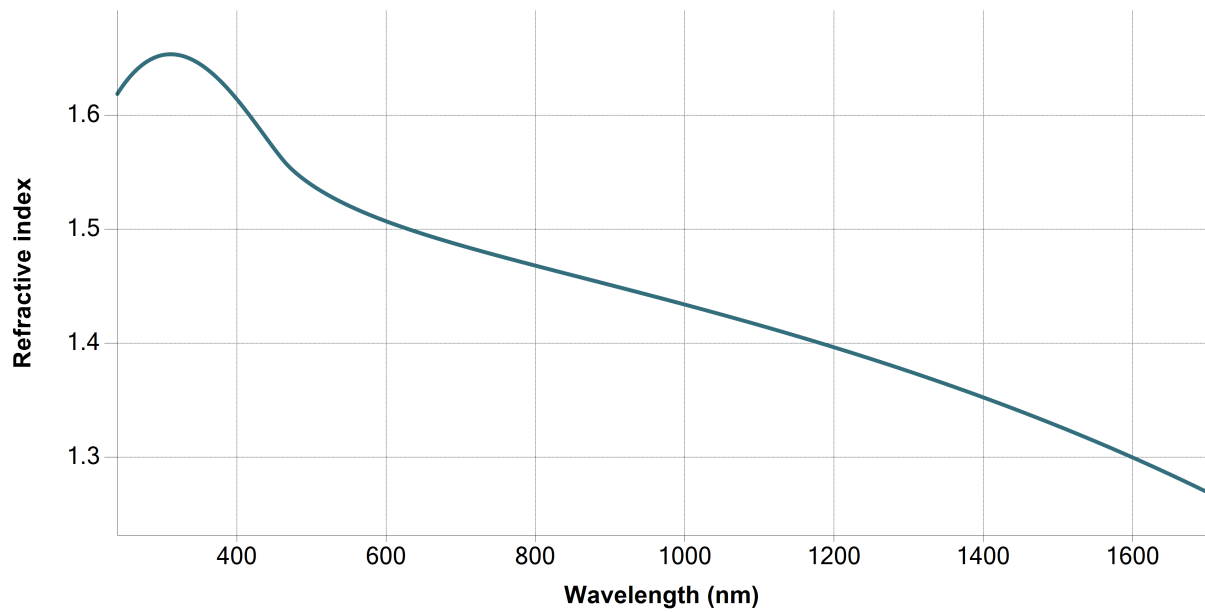
Phase 1 (ITO) - Dispersion graphs

Substrate (si) - Dispersion graphs

Correlation coefficients

	Ph2 - ITO + void - Thickness	Ph1 - ITO - Thickness	Ph1 - Tauc-Lorentz[1] - A (eV)	Ph1 - Tauc-Lorentz[1] - E0 (eV)	Ph1 - Tauc-Lorentz[1] - C (eV)	Ph1 - Tauc-Lorentz[1] - Eg (eV)	Ph1 - Drude[2] - E_p (eV)
Ph2 - ITO + void - Thickness	1	-0.4228	-0.1028	0.0489	-0.0996	-0.0157	-0.0952
Ph1 - ITO - Thickness		1	0.011	0.0234	0.0462	0.0124	-0.3065
Ph1 - Tauc-Lorentz[1] - A (eV)			1	-0.2143	0.9674	0.8799	0.4422
Ph1 - Tauc-Lorentz[1] - E0 (eV)				1	0.0362	-0.5271	0.2247
Ph1 - Tauc-Lorentz[1] - C (eV)					1	0.7563	0.4882
Ph1 - Tauc-Lorentz[1] - Eg (eV)						1	0.3014
Ph1 - Drude[2] - E_p (eV)							1