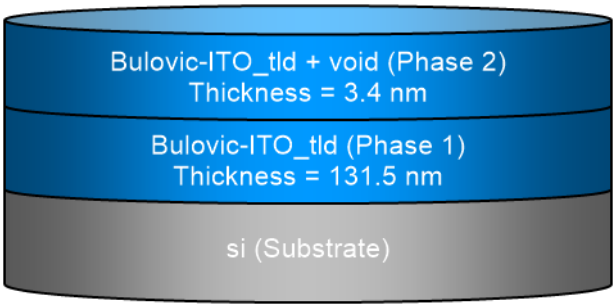
SEA regression report summary

Sample ID
001d 65° 1
001d 70° 2
001d 75° 3

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	26-08-2021 15:56
Comments	

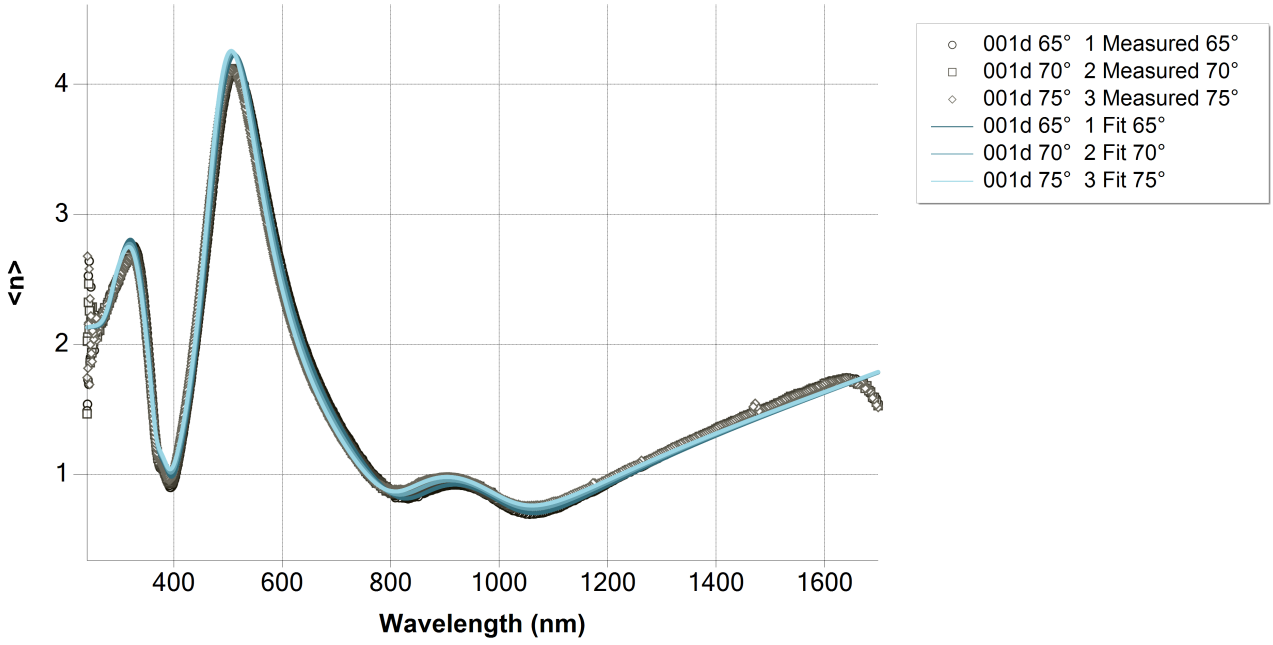
Layer structure	
Overview	
	
Optical model	
Phase 2	Bulovic-ITO_tld + void
Diffusion	
Phase 1	Bulovic-ITO_tld
Dispersion law	Tauc-Lorentz
	Drude

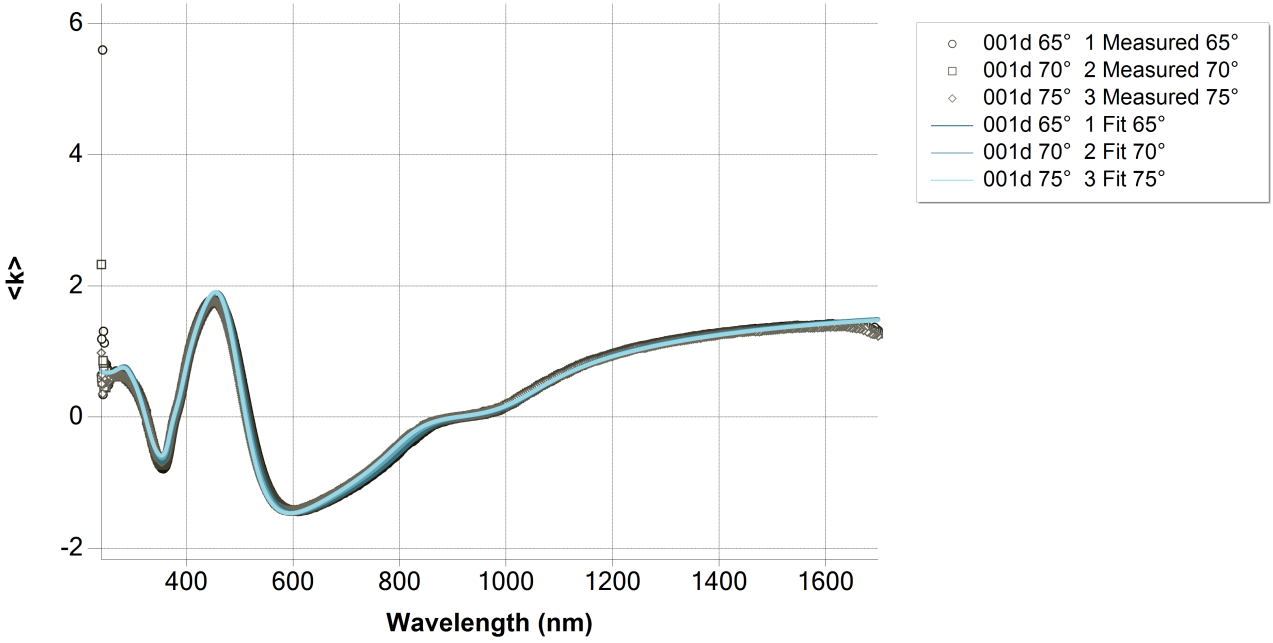
Regression results

Measurement information				
Measurement 1				
Measurement file path	C:\Users\emmabat\ito-si\001d.smdx			
Angle of Incidence	65°			
Measurement 2				
Measurement file path	C:\Users\emmabat\ito-si\001d.smdx			
Angle of Incidence	70°			
Measurement 3				
Measurement file path	C:\Users\emmabat\ito-si\001d.smdx			
Angle of Incidence	75°			
Regression details				
Regression 1 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	65°			
Fit to	<n>, <k>			
Regression 2 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	70°			
Fit to	<n>, <k>			
Regression 3 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	75°			
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 (Bulovic-ITO_tld + void)				
Thickness	3.433	X	0.11863	nm
Depolarization coefficient	0.33333			
Concentration 1	0.5			
Concentration 2	0.5			
Phase 1 (Bulovic-ITO_tld)				
Thickness	131.479	X	0.17785	nm
A (eV)	278.49483	X	16.59508	eV
E0 (eV)	9.92194	X	0.14217	eV
C (eV)	41.93631	X	3.17584	eV
Eg (eV)	2.64721	X	0.010175	eV
E_p (eV)	0.86282	X	0.0075371	eV
E_Γ (eV)	0			eV
Eps_inf	0			
Derived parameters	Value			

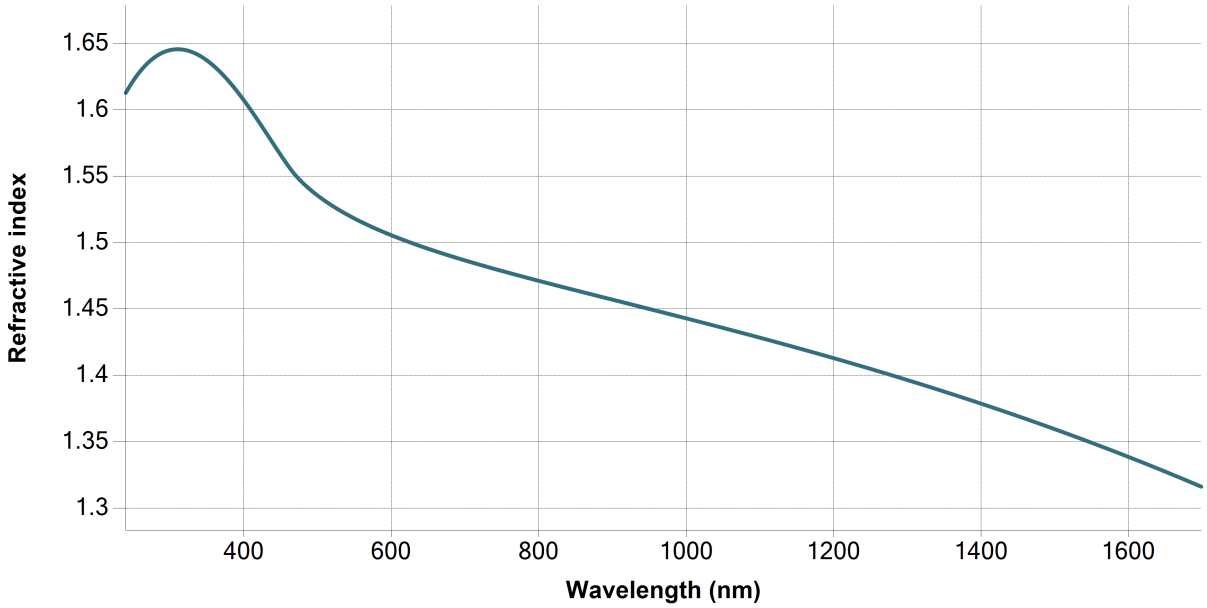
Phase 2 (Bulovic-ITO_tld + void)		
n @ 632.8 nm	1.4986	
k @ 632.8 nm	0	
Phase 1 (Bulovic-ITO_tld)		
n @ 632.8 nm	2.055	
k @ 632.8 nm	0	
Substrate (si)		
n @ 632.8 nm	3.8811	
k @ 632.8 nm	0.0195	
Drude derived parameters	Value	Unit
Phase 1 (Bulovic-ITO_tld)		
Conductivity (S/m)	∞ ± NaN	S/m
Resistivity (mΩ.cm)	0 ± NaN	mΩ.cm
Resistance (Ω/sq)	0 ± NaN	Ω/sq
N type dopant concentration (at/cm3)	1.3498E+20 ± 2.3582E+18	at/cm3
P type dopant concentration (at/cm3)	1.9977E+20 ± 3.4901E+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	0.99573	
RMSE	0.06155	

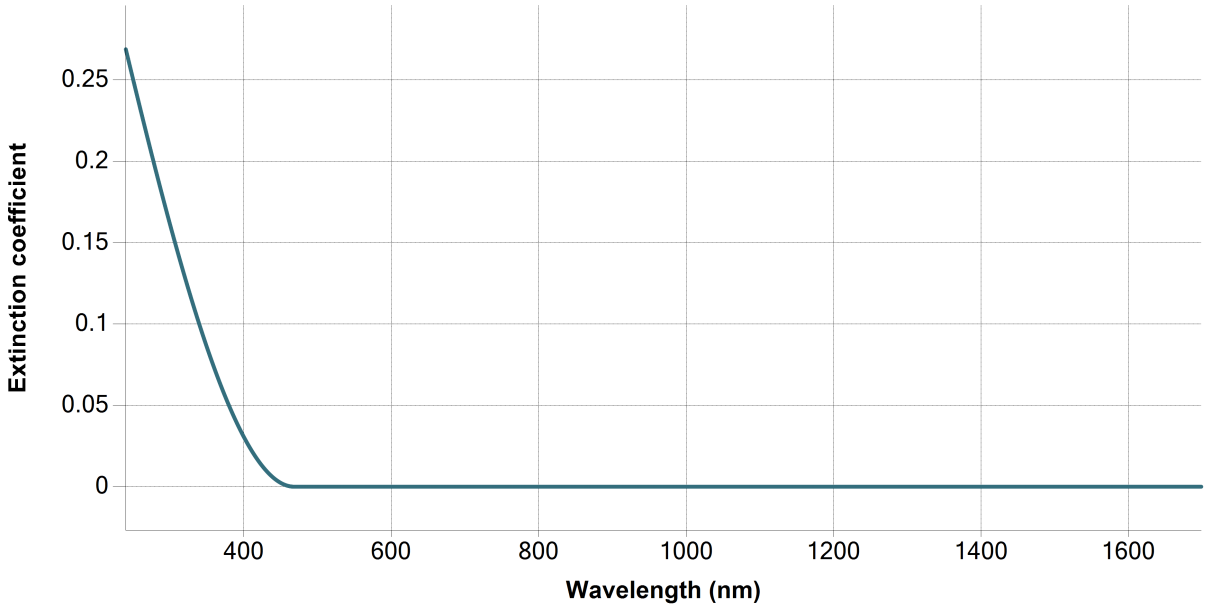
Regression graphs



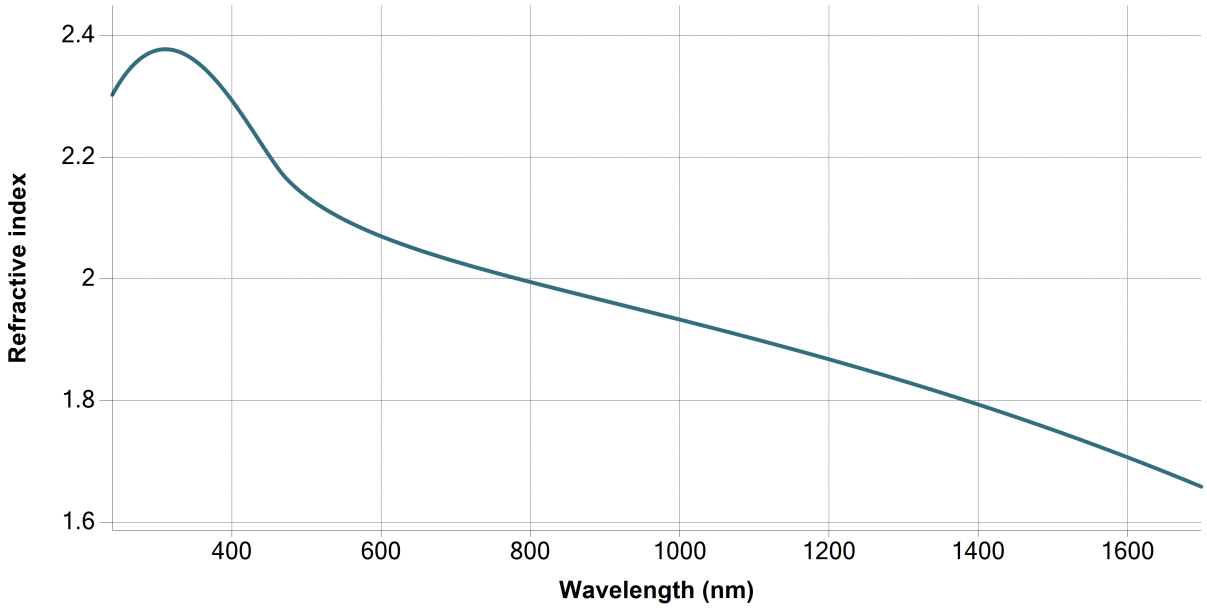


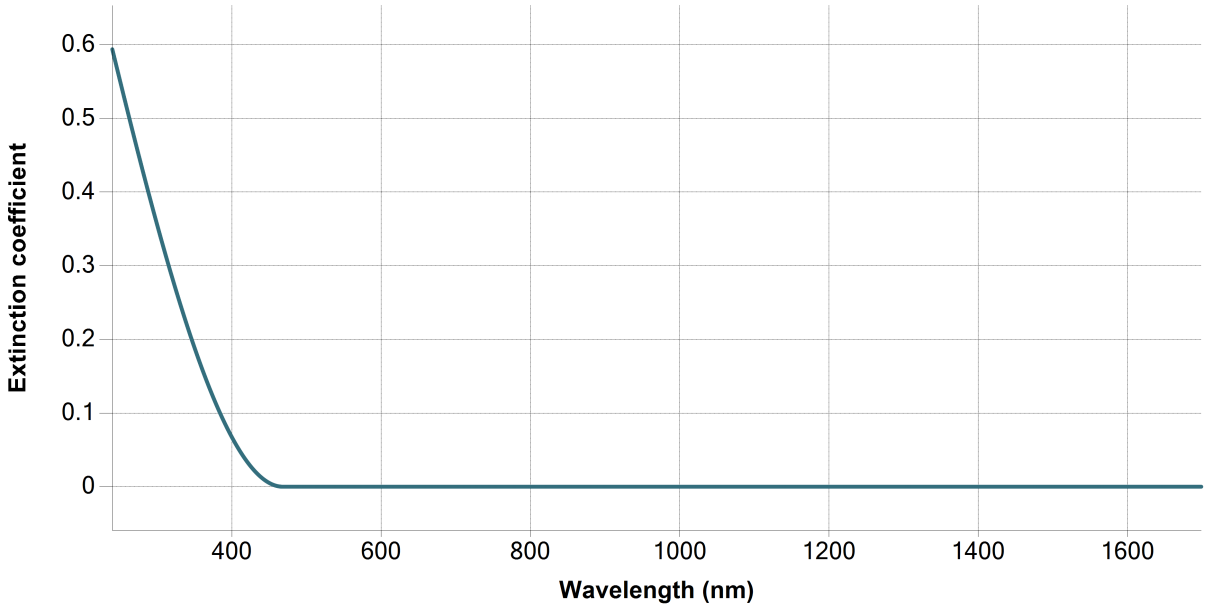
Phase 2 (Bulovic-ITO_tld + void) - Dispersion graphs



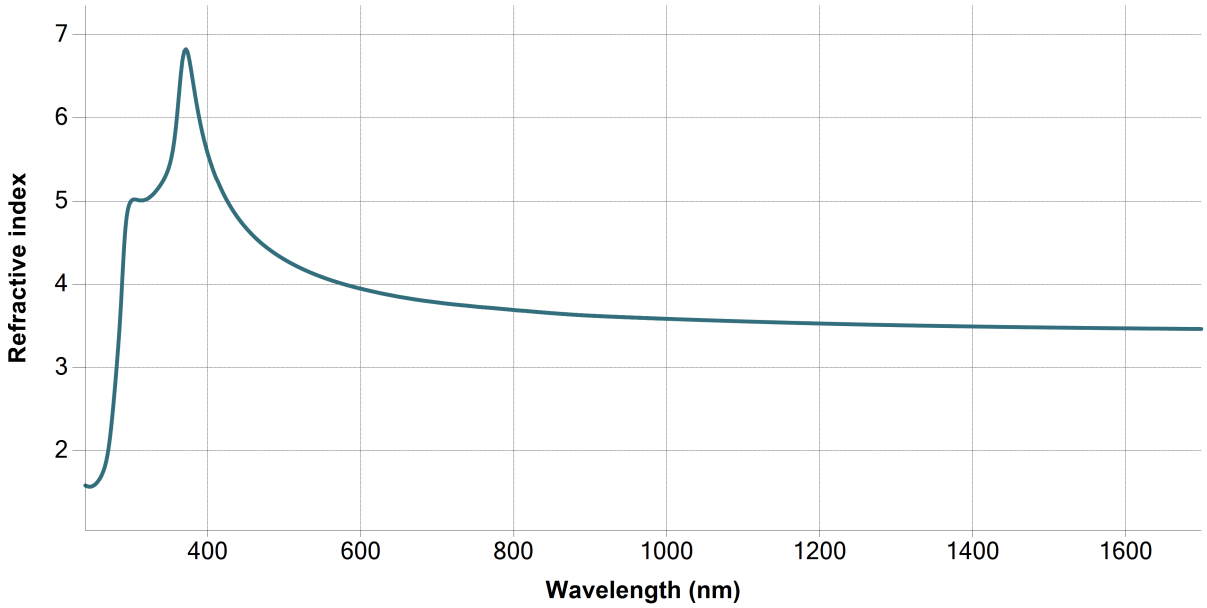


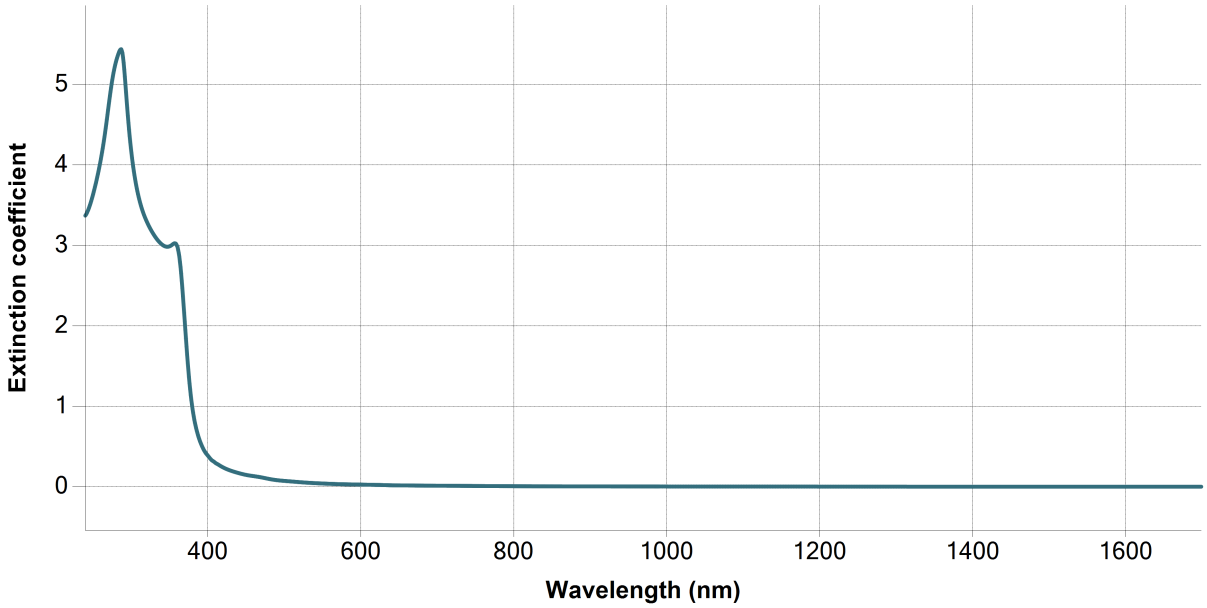
Phase 1 (Bulovic-ITO_tld) - Dispersion graphs





Substrate (si) - Dispersion graphs





Correlation coefficients							
	Ph2 - Bulovic-ITO_tld + void - Thickness	Ph1 - Bulovic-ITO_tld - 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 - Bulovic-ITO_tld + void - Thickness	1	-0.5108	-0.1563	-0.036	-0.1628	-0.0567	-0.0944
Ph1 - Bulovic-ITO_tld - Thickness		1	0.0398	0.0469	0.0746	0.0326	-0.2629
Ph1 - Tauc-Lorentz[1] - A (eV)			1	0.169	0.9726	0.8746	0.4606
Ph1 - Tauc-Lorentz[1] - E0 (eV)				1	0.3899	-0.2105	0.4148
Ph1 - Tauc-Lorentz[1] - C (eV)					1	0.7595	0.5068
Ph1 - Tauc-Lorentz[1] - Eg (eV)						1	0.3038
Ph1 - Drude[2] - E_p (eV)							1