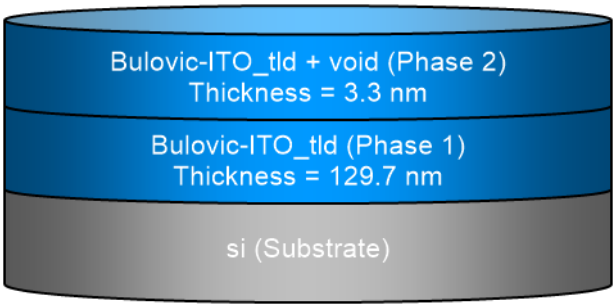
SEA regression report summary

Sample ID
001f 65° 1
001f 70° 2
001f 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 16:05
Comments	

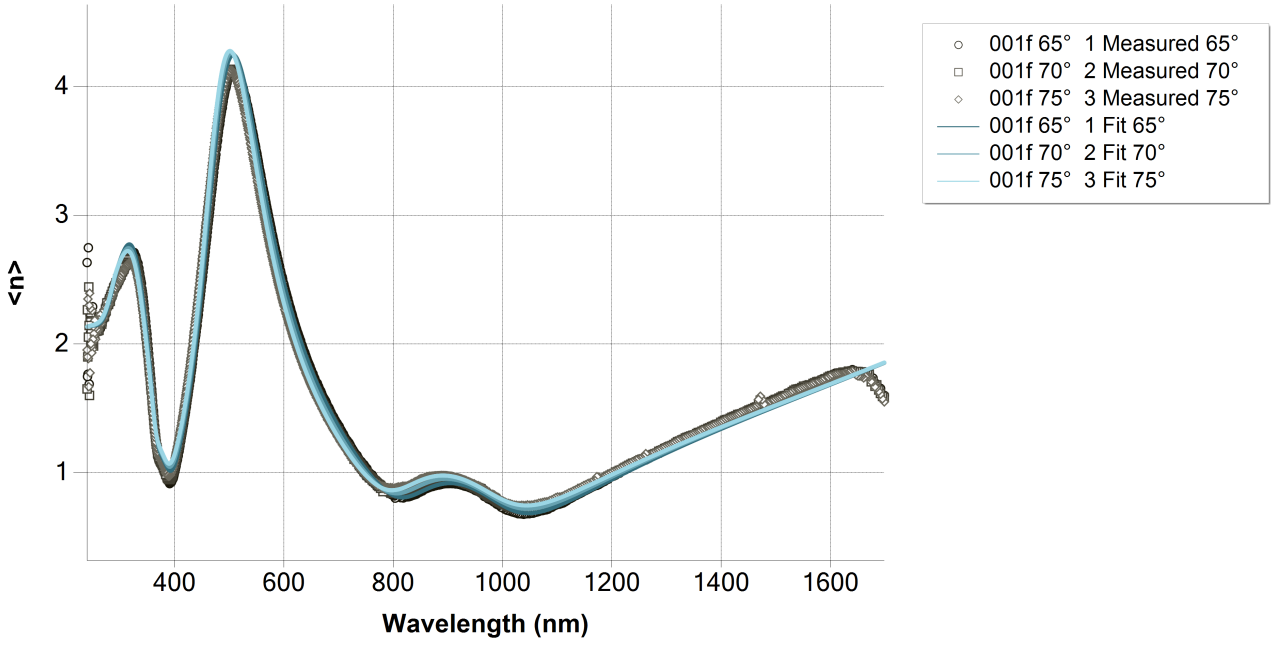
Layer structure	
Overview	
	
Optical model	
Phase 2	Bulovic-ITO_tld + void
Diffusion	
Phase 1	Bulovic-ITO_tld
Dispersion law	Tauc-Lorentz
	Drude

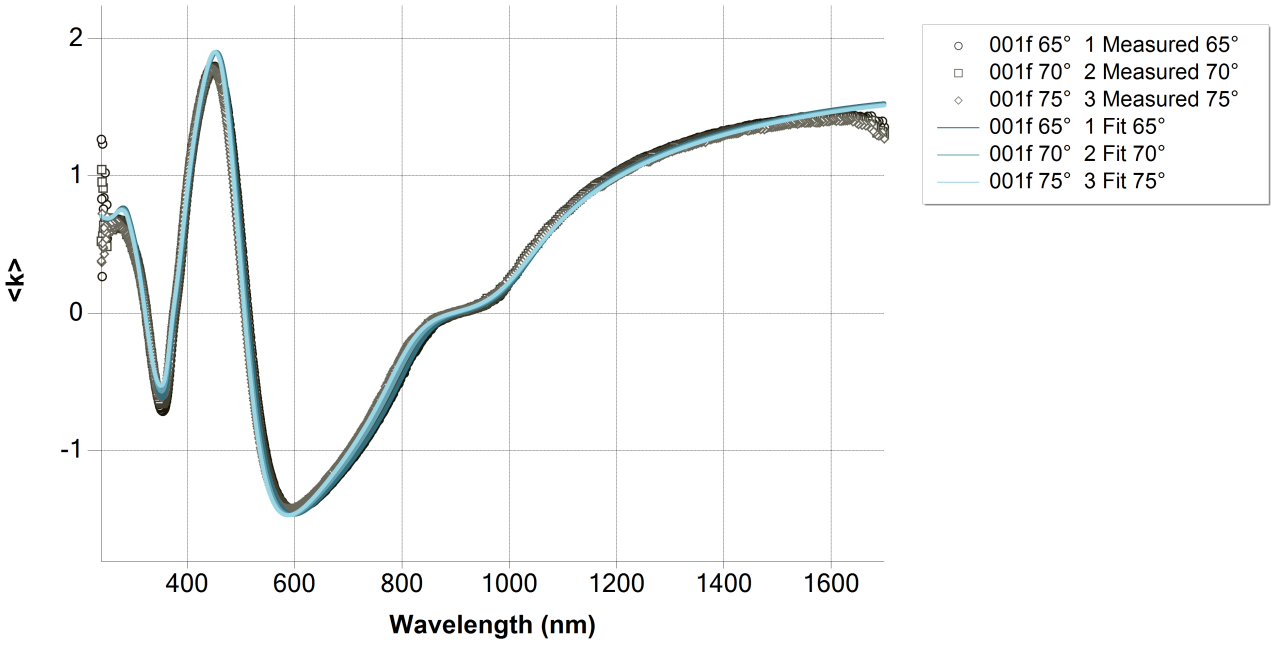
Regression results

Measurement information				
Measurement 1				
Measurement file path	C:\Users\emmabat\ito-si\001f.smdx			
Angle of Incidence	65°			
Measurement 2				
Measurement file path	C:\Users\emmabat\ito-si\001f.smdx			
Angle of Incidence	70°			
Measurement 3				
Measurement file path	C:\Users\emmabat\ito-si\001f.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	3.345	X	0.092058	nm
Depolarization coefficient	0.33333			
Concentration 1	0.5			
Concentration 2	0.5			
Phase 1 (Bulovic-ITO_tld)				
Thickness	129.738	X	0.14468	nm
A (eV)	275.52469	X	13.20441	eV
E0 (eV)	9.77151	X	0.11243	eV
C (eV)	40.51292	X	2.45126	eV
Eg (eV)	2.64064	X	0.0083282	eV
E_p (eV)	0.91224	X	0.005595	eV
E_Γ (eV)	0			eV
Eps_inf	0			
Derived parameters	Value			

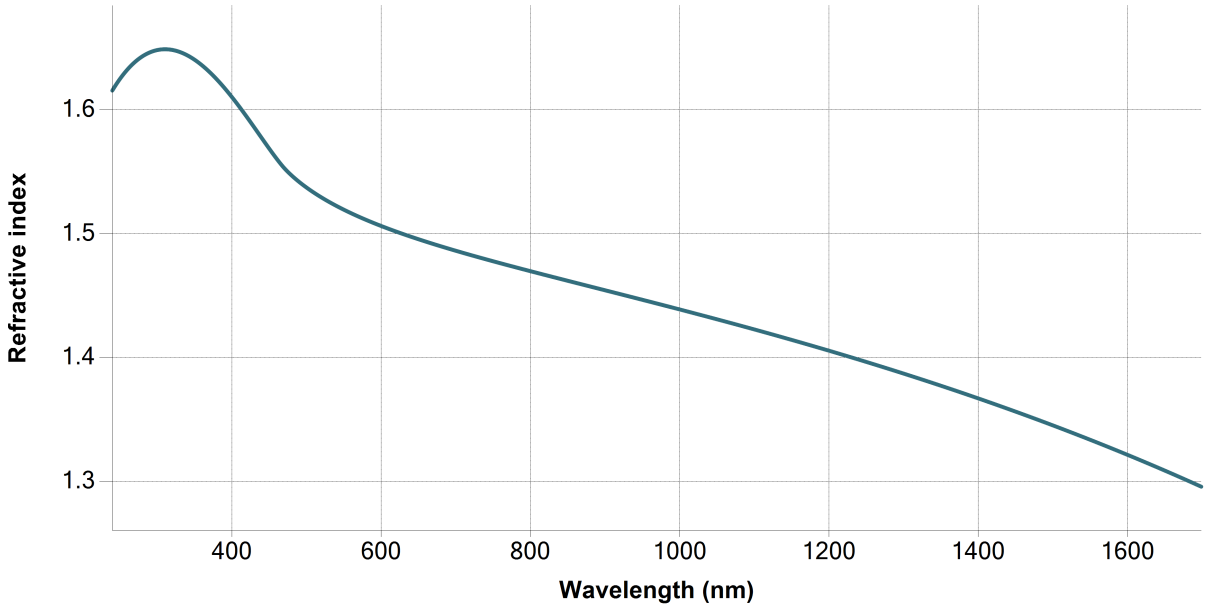
Phase 2 (Bulovic-ITO_tld + void)		
n @ 632.8 nm	1.499	
k @ 632.8 nm	0	
Phase 1 (Bulovic-ITO_tld)		
n @ 632.8 nm	2.0558	
k @ 632.8 nm	0	
Substrate (si)		
n @ 632.8 nm	3.8811	
k @ 632.8 nm	0.0195	
Drude derived parameters	Value	Unit
Phase 1 (Bulovic-ITO_tld)		
Conductivity (S/m)	∞ ± NaN	S/m
Resistivity (mΩ.cm)	0 ± NaN	mΩ.cm
Resistance (Ω/sq)	0 ± NaN	Ω/sq
N type dopant concentration (at/cm3)	1.5089E+20 ± 1.8508E+18	at/cm3
P type dopant concentration (at/cm3)	2.2331E+20 ± 2.7392E+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	0.99661	
RMSE	0.05454	

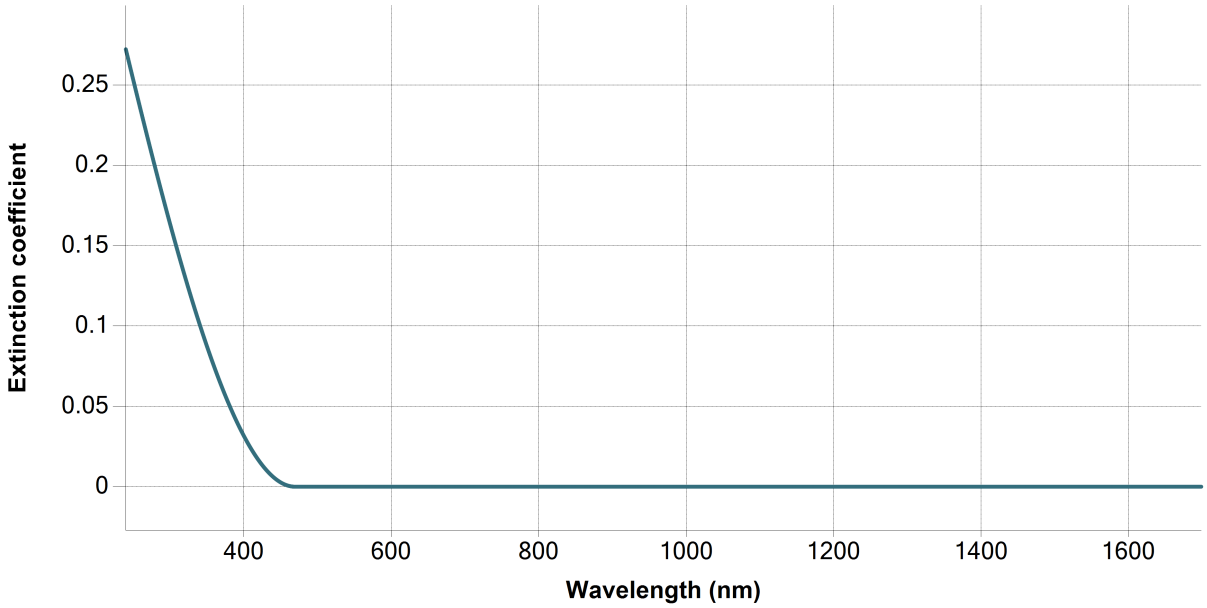
Regression graphs



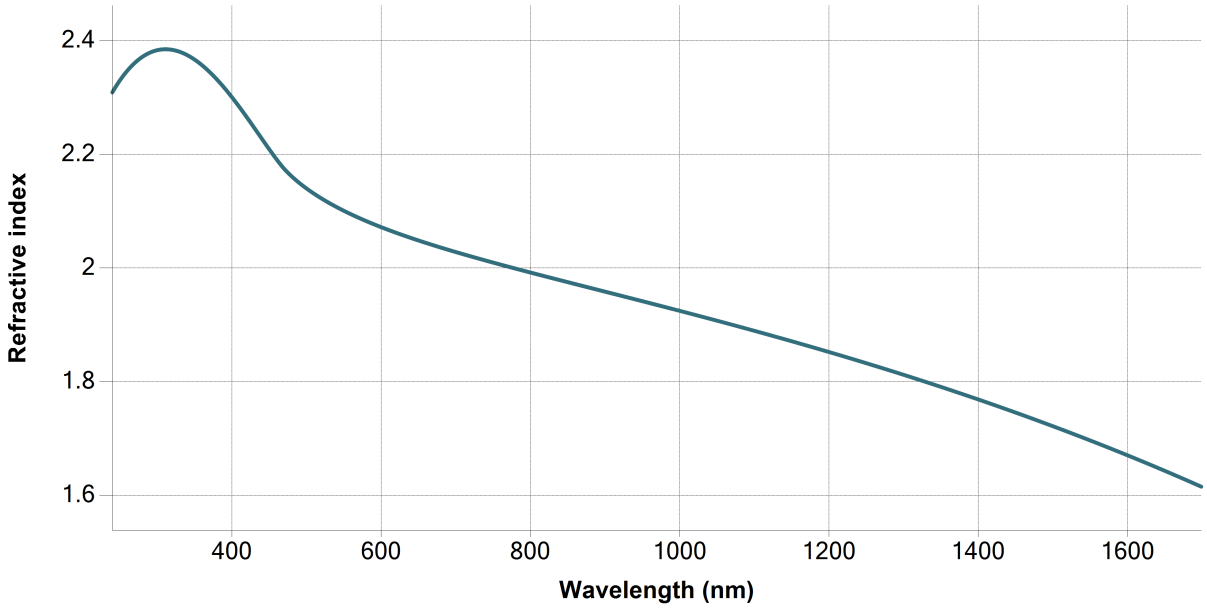


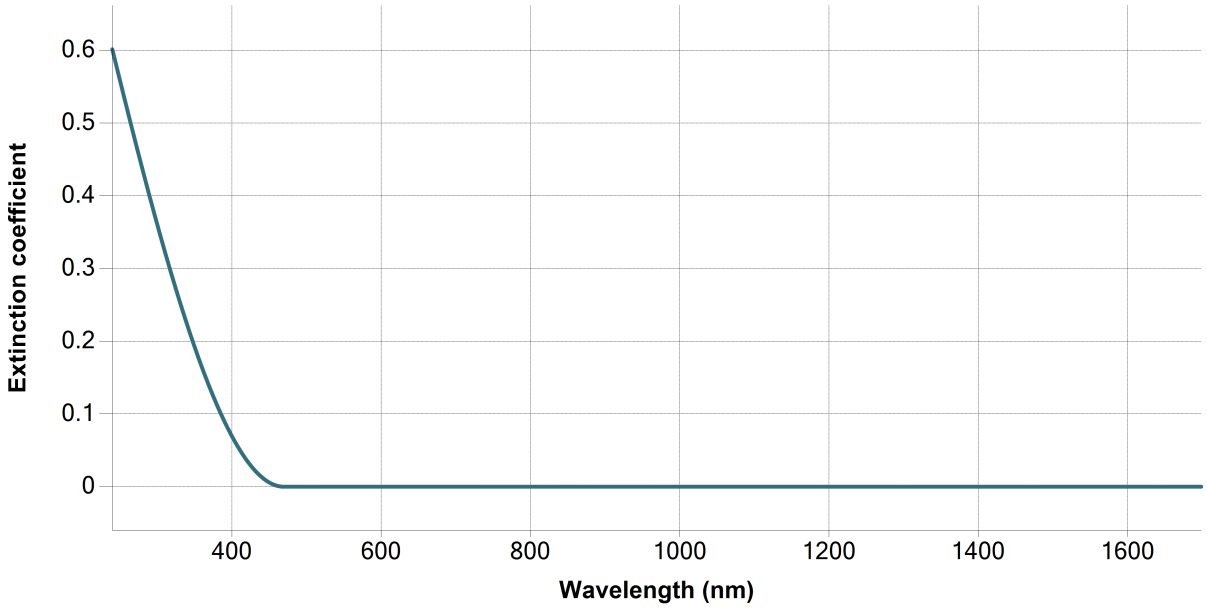
Phase 2 (Bulovic-ITO_tld + void) - Dispersion graphs



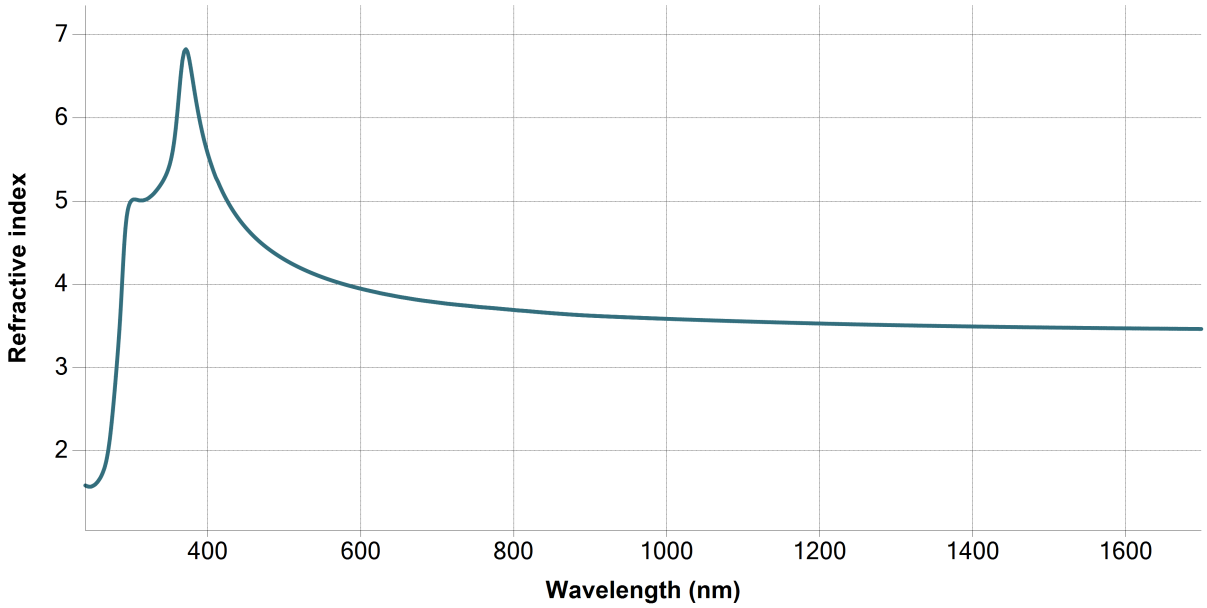


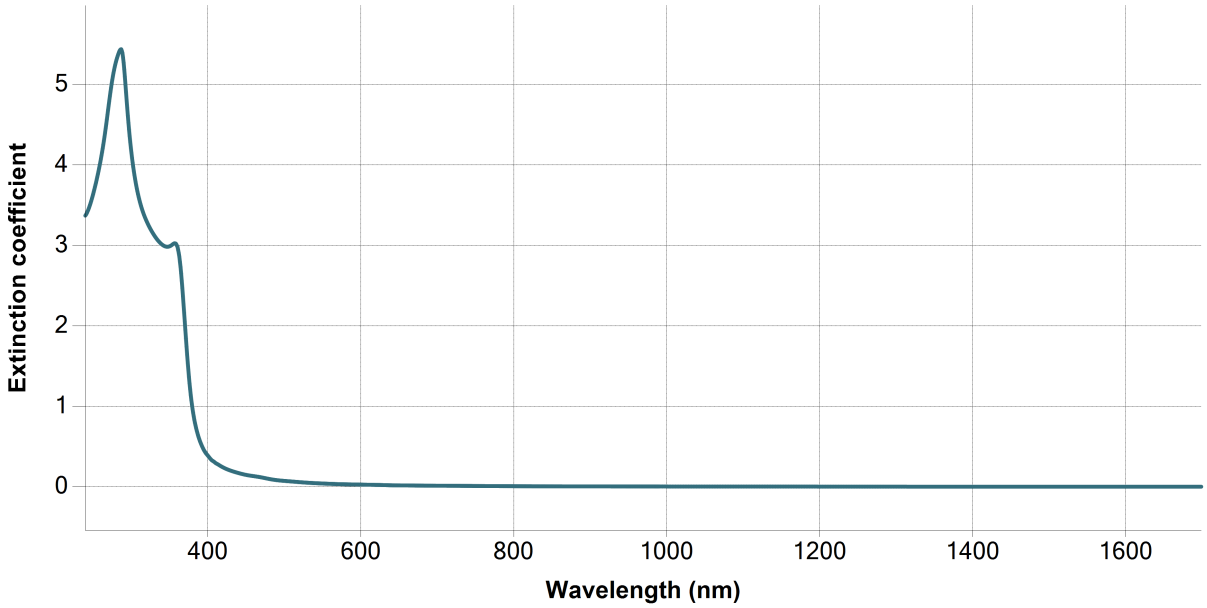
Phase 1 (Bulovic-ITO_tld) - Dispersion graphs





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	-0.4228	-0.1071	0.0175	-0.1037	-0.0209	-0.1002
Ph1 - Bulovic-ITO_tld - Thickness		1	-0.0008	0.0251	0.034	0.0072	-0.3019
Ph1 - Tauc-Lorentz[1] - A (eV)			1	0.1238	0.9714	0.8741	0.4575
Ph1 - Tauc-Lorentz[1] - E0 (eV)				1	0.3518	-0.2486	0.376
Ph1 - Tauc-Lorentz[1] - C (eV)					1	0.7568	0.4986
Ph1 - Tauc-Lorentz[1] - Eg (eV)						1	0.3073
Ph1 - Drude[2] - E_p (eV)							1