

Bede REFS 4 Report

SUMMARY

Company: Bede Scientific Incorporated, USA

Equipment:

Operator: Matthew Wormington

Lot:

Carrier:

Substrate:

Site:

Comments: Bede REFS example file: Ta layer atop Al2O3 substrate. The specular X-ray reflectivity were measured using CuK α radiation.

Description: Specular X-ray reflectivity scan assuming 3 Å radiation. The incident and background intensities are 165371368.45 cps and 28.99 cps, respectively. The sample angle (Omega) starts at 0 sec, and finishes at 14400 sec with a step-size of 25.2 sec. Simultaneously, the detector angle (2Theta) starts at 0 sec and finishes at 28800 sec with a step-size of 50.4 sec.

FILES

Model: C:\Users\HP\Desktop\zro2.mod

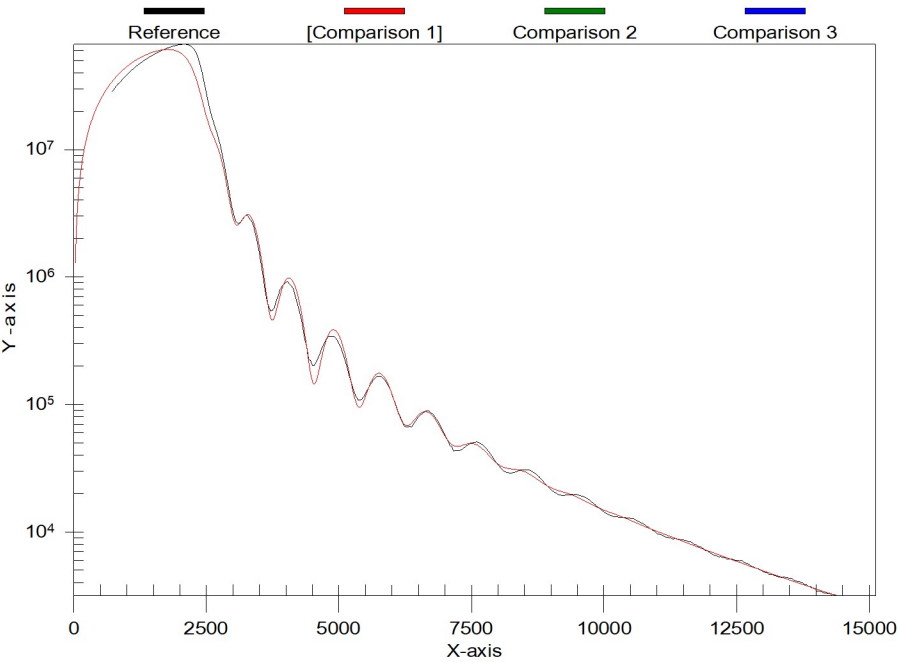
Reference: C:\Users\HP\Desktop\zro2.txt

Comparison 1:

Comparison 2:

Comparison 3:

Goodness-of-fit:



ID	THICKNESS (Å)	MATERIAL	X	Y	DENSITY (%)	ROUGHNESS (Å)	GRADING (Å)	LAMELLAE	PERIODS
SUB.	¥	Si	0.000	0.000	100.00	23.38	0.00	1	
1	71.73	SiO2	0.000	0.000	2.33	2.24	0.00	1	
2	320.24	ZrO2	0.000	0.000	100.00	16.40	0.00	1	

EQUIPMENT

Incident Beam

Width: 0.37 mm
Height: 8 mm
Divergence: 300 sec

Detector Slits

Width: 12 mm
Height: 16 mm
Distance to sample: 26 cm
Acceptance: 9518.2 sec

Include Equipment Function: ☐

MEASUREMENT

Scan Type:

Specular

Wavelength:

3 Å

Intensity:

165371368.45 cps

Background:

28.99 cps

Sample (W) Axis

Start:

0 sec

Finish:

14400 sec

Step:

25.2 sec

Detector (2θ) Axis

Start:

0 sec

Finish:

28800 sec

Step:

50.4 sec

Data points =

572

SAMPLE

Advanced Roughness

Roughness model:

Uncorrelated Interfaces

Correlation length:

10000 Å

Fractal exponent:

1

Miscut angle

0 deg

Dimensions

Length:

26 mm

Width:

30 mm

Radius of curvature:

290 m

OPTIONS

Units

Angle units: Seconds
Length units: Ångstroms
Output units: Real Space

Diffuse Scans

Include specular intensity: ☐
Use C(r) instead of exp[C(r)-1]: ☐
Use modified Born approximation: ☐

DATA-FITTING

Strategy:

DE/rand/1/bin

Population size:

30

Crossover factor:

0.5

Mutation factor:

0.7

GOF function:

MAE (log10)

Complete When

☐ Iterations =

5000

☐ Generations =

1000

☐ Elapsed time (s) =

600

☐ GOF function <=

0