

# Bede REFS Report

## SUMMARY

**Company:** Condensed Matter Physics, Sch of Physics & Astronomy, University  
**Equipment:** Bruker parameter settings  
**Operator:** Mannan Ali  
**Lot:**  
**Carrier:**  
**Substrate:**  
**Site:**  
**Comments:** Note that these are the parameter settings for Bruker D8

**Description:** Specular X-ray reflectivity scan assuming 1.541 Å radiation. The incident and background intensities are 18588609.74 cps and 29.58 cps, respectively. The sample angle (Omega) starts at 0.05 deg, and finishes at 7.5 deg with a step-size of 0.025 deg. Simultaneously, the detector angle (2Theta) starts at 0.1 deg and finishes at 15 deg with a step-size of 0.05 deg.

## FILES

**Model:** S:\Projects\PMA systems\Adam\Arkengarthdale\AW270614\AW270614-21-LAX-Ark-Bede-Ox-MidCo.mod

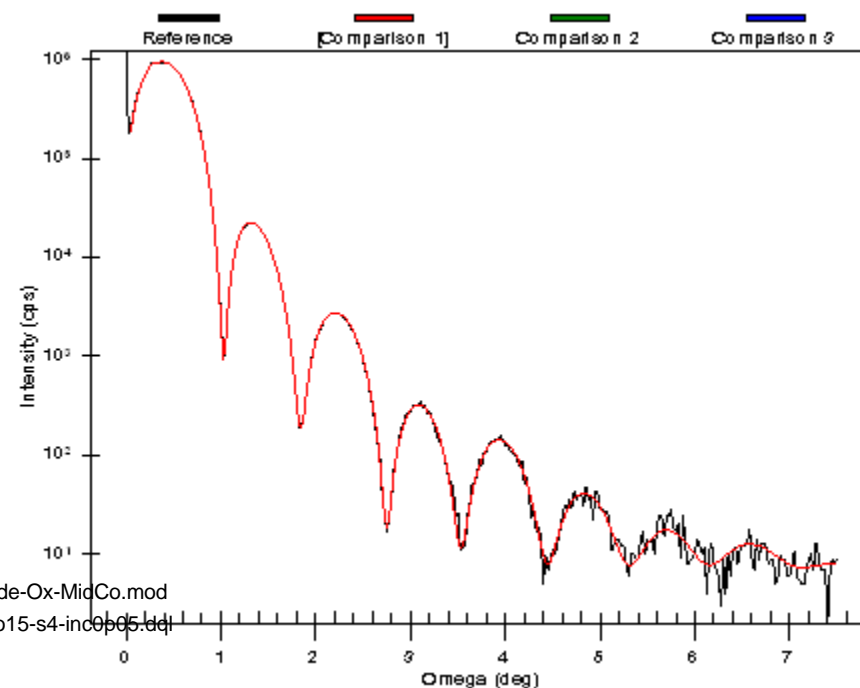
**Reference:** S:\Projects\PMA systems\Adam\Arkengarthdale\AW270614\AW270614-21-LAX-Ark-0to15-s4-inc005.dd

**Comparison 1:**

**Comparison 2:**

**Comparison 3:**

**Goodness of fit:** 0.054



ID	THICKNESS (Å)	MATERIAL	X	Y	DENSITY (%)	Roughness	GRADING (Å)	LAMELLAE	PERIODS
SUB.	∞	Al2O3	0.000	0.000	102.00	5.11	0.00	1	
1	22.38	Al2O3	0.000	0.000	77.53	1.77	0.00	1	
2	29.33	Pt	0.000	0.000	98.50	5.43	0.00	1	
3	0.10	Co	0.000	0.000	125.04	0.09	0.00	1	
4	6.01	Co	0.000	0.000	101.93	5.93	0.00	1	
5	11.19	Pt	0.000	0.000	103.75	6.69	0.00	1	
6	3.65	PtO	0.000	0.000	85.94	1.35	0.00	1	

**EQUIPMENT****Incident Beam**

Width: 0.2 mm  
Height: 10 mm  
Divergence: 0.003 deg

**Detector Slits**

Width: 0.1 mm  
Height: 5 mm  
Distance to Sample: 29 cm  
Acceptance: 0.01976 deg

Include Equipment Function: ☒

**OPTIONS****Units**

Angle Units: Degrees  
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: ☐

**MEASUREMENT**

Scan Type: Specular  
Wavelength: 1.541 Å  
Intensity: 18588609.74 cps  
Background: 29.58 cps

**Sample  $\Psi$  Axis**

Start: 0.05 deg  
Finish: 7.5 deg  
Step: 0.025 deg

**Detector  $\Theta$  Axis**

Start: 0.1 deg  
Finish: 15 deg  
Step Size: 0.05 deg

Data Points: 299

**EVOLVER**

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 <= 0.001

**SAMPLE****ROUGHNESS (Å)****Uncorrelated Interfaces**

Correlation Length: 10000 Å  
Fractal Exponent: 1  
Miscut Angle: 0 deg

Length: 10 mm

Width: 10 mm

Radius of Curvature:  $\infty$