Rigaku D/Max – B x-ray diffractometer instrument specs (general)

Make: Rigaku
Model: D/Max - B

Cobalt target X-ray tube (40 KV and 30 mA)

Cobalt Kα radiation (composed of Co $K\alpha_1$ = 1.7890 Å and Co $K\alpha_2$ = 1.7929 Å; the weighted average of the two is Co $K\alpha_{avg}$ = 1.7903 Å)

Bragg Brentano parafocusing geometry

Diffracted beam monochromator (curved graphite crystal)
monochromator angle = 15.53 degrees (2theta = 31.05 degrees)

1 degree divergence slit
1 degree scatter slit
.3 mm receiving slit
.8 mm monochromator receiving slit
Incident and diffracted beam Soller slits (angular aperture = 5 degrees)

goniometer radius = 185mm

Example:

"X-Ray diffraction data were taken with a Rigaku D/Max-B x-ray diffractometer with Bragg – Brentano parafocusing geometry, a diffracted beam monochromator, and a conventional cobalt target x-ray tube set to 40 KV and 30 mA."

Rigaku D/Max-B Instrument parameters (detailed)

X-ray tube focus (normal)	0.1 x 10 mm
Take-off angle	6˚
Goniometer radius (source to sample = sample to RS)	185 mm
Sample to SS	141 mm
DS to sample	~90 mm
DS height	10 mm
DS width (typical)	1˚
RS height	20 mm
RS width (typical)	0.3˚
Soller slit (incident beam) angular aperture	5˚

l~ 10mm, s ~ .5 mm ($2\Delta = 2\tan^{-1}(s/l) = 5.72^\circ$)	
Soller slit (diffracted beam) angular aperture	5°
l = 25 mm, s = 1mm ($2\Delta = 2\tan^{-1}(s/l) = 4.58^\circ$)	
Effective diffracted beam angular aperture w/out soller slit(2Δ)	7.94°
s = goniometer radius + monochromator beam path = 288 mm	
l = RS_M height = 20 mm	
Effective diffracted beam angular aperture w/out mono and soller slit(2Δ)	12.3°
s = goniometer radius = 185mm, l = RS height = 20 mm	
Fixed sample irradiation height	~16 mm
<u>Diffracted-Beam monochromator</u>	
Curved graphite crystal with [0002] d = 6.708 Å; curvature = 224 mm	
RS to crystal distance	59.8 mm
RS_M to crystal distance	59.8 mm
θ_2	15.53°
$2\theta_2$	31.05°

Items in red are educated guesses or experimental measurements with some degree of uncertainty