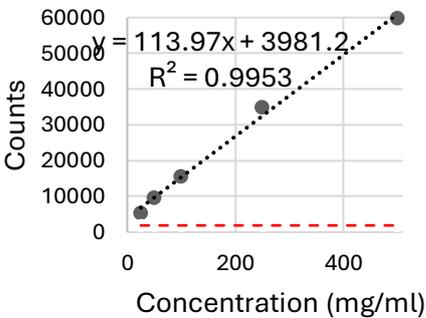


## Raman instrument Table specifications

Specification	Criteria	Notes	Actual measured performance
<b>Laser power (450 mw setting)</b>	Minimum 400 mW < measured < 475 mW Recommended 500+ mW	Measured w/power meter out of excitation port of AIO	230 mW (measured at power meter)
<b>Wavenumber resolution</b>	Minimum: Average resolution across six HgAr peaks < 6.5 cm <sup>-1</sup> (with no peak exceeding 8 cm <sup>-1</sup> ) while maximizing signal throughput	HgAr peaks <ul style="list-style-type: none"> <li>• 794.818</li> <li>• 826.452</li> <li>• 853.144</li> <li>• 912.297</li> <li>• 965.778</li> <li>• 1013.975</li> </ul> Xe peaks <ul style="list-style-type: none"> <li>• 580.00</li> <li>• 650.86</li> <li>• 1390.50</li> </ul>	Note wavenumber resolution is identical across the range, Per pixel.  Xe lamp used.  Resolution per pixel: 1.953  Peak FWHM: < 4 pixels  SHS design results in identical resolution in wavenumber space across the range, no spreading as no slit present.
<b>Wavenumber Accuracy</b>	Minimum +/- 1 cm <sup>-1</sup> from ASTM values of main Cyclohexane	Cyclohexane 801.3 1028.3 1157.6 1266.4 1444.4  2852.9	Corresponding peaks: 801.75 1028.50 / 1266.02 1444.3  Out of SHS range
<b>Intensity Throughput</b>	Minimum peak 883cm <sup>-1</sup> 40000 counts	Acquired at 450 mW laser power setting 300 ms acquisition time. 10 averages, dark subtracted no further processing.	At 230 mW  62,600 (note systems is SHS design so counts must be calculated from contrast presentation – FT spectrometer does not measure counts directly) with 300 ms integration.  Scaled to 450 mW = 125,200 counts.  Continuous acquisitions – each frame having 10 averages.
<b>Intensity stability</b>	Intensity stability minimum of +/- 1.5 % peak height at stable temperature	Measured by ethanol. Peak count over continuous acquisitions of 10 averages at 450 mW	Standard deviation is 0.65 % Max deviation over 10 frames 1.16 %  With 230 mW laser

		with 300 ms integration time	
<b>Wavenumber stability</b>	Measured over 8 hours	Using cyclohexane	< 1 cm <sup>-1</sup>
<b>10ms noise</b>	Recommended: ≤ 4.0 Counts Minimum: ≤ 5.0 Counts	Measured as the average, per-pixel standard deviation of counts from 100 dark spectra with 10 ms integration time.	Multiple camera setting  Fast: < 2 counts  Med speed: < 1 count  Slow high sensitivity speed: < 1 count
<b>+10,000 ms Noise</b>	Recommended: ≤ 15.0 Counts	Measured as the average, per-pixel standard deviation of counts from 25 dark spectra with 10,000 ms integration time.	Different cooled setting  -40 < 4 counts -50 < 2 counts -60 < 2 counts -70 < 2 counts
<b>Recommended: 100 – 3215 cm<sup>-1</sup> Minimum: 300 – 2500 cm<sup>-1</sup></b>	N/A	N/A	200 – 2500 cm <sup>-1</sup> (as standard wider range can be produced if required)
<b>Minimum: &gt; 9 response curve slope Recommended: &gt; 10 response curve slope</b>	Measured by the slope of an instrument response curve produced by measuring the area under the curve of multiple concentrations (b/w 0-500 mg/mL) for the sodium benzoate peak at ~1004 cm <sup>-1</sup> (995-1011 cm <sup>-1</sup> ) after subtraction of water background fitted to sodium benzoate spectra using weighted EMSC <i>(20 sample acquisitions for each concentration. Acquisition parameters: 450 mW laser power, 2500 ms exposure time, 18 averages)</i>	Sodium benzoate samples at 0, 25, 50, 100, 250, and 500 mg/mL	<p><b>Sodium Benzoate peak @ 1004cm<sup>-1</sup></b></p>  <p>1000ms exposure time for the above results 20 acquisitions- each frame having 18 averages  limit of detection: &lt; 5mg/ml</p>