

UV/Vis Spectrophotometer Performance Monitoring and Maintenance

Table of Contents

1	INTRODUCTION	2
2	SCOPE	2
3	EQUIPMENT	2
4	STANDARDS AND CONTROLS	2
5	PROCEDURE	2
5.1	Daily Checks	2
6	INSTRUMENTAL CONDITIONS.....	3
6.1	UV/Vis Spectrometer.....	3
7	ACCEPTANCE CRITERIA.....	3
7.1	Testmix.....	3
8	LIMITATIONS	3
9	REVISION HISTORY	3

UV/Vis Spectrophotometer Performance Monitoring and Maintenance

1 INTRODUCTION

This document addresses the performance monitoring and maintenance of the UV-Vis Spectrophotometer. The UV-Vis Spectrophotometer is used to measure the absorbance of light in the ultraviolet and visible regions of the electromagnetic spectrum. All identifications of spectral regions are based on absorption band positions which are given in wavelength (nm). Definitions and guidelines are outlined in IOSS-701.

2 SCOPE

This document applies to personnel using the associated instrument(s)/equipment in Quantico, VA in the following disciplines/subdisciplines: General Chemistry and Seized Drugs.

3 EQUIPMENT

- Instrumentation
 - Thermo-Fisher Evolution 220 UV-Vis Spectrophotometer with Insight 2 software (or equivalent)
- Materials
 - 1.0 cm quartz cuvette cell (or equivalent)
 - Caffeine (USP grade or equivalent)
 - Deionized Water, 18.2 MΩ·cm (Milli-Q or equivalent)
 - General laboratory supplies

4 STANDARDS AND CONTROLS

- Testmix

The testmix is used to assess daily operating performance and continued integrity of the system. The testmix for the UV-Vis is a 10 ppm standard solution of caffeine in water. To prepare, weigh 10 mg caffeine. Dilute to 1000 mL with deionized water in a volumetric flask. Store the solution at room temperature. This solution does not expire, but should be re-evaluated for continued use after five years.

5 PROCEDURE

5.1 Daily Checks

The following steps will be performed daily. Enter the information in the appropriate log for tracking purposes.

- A. Allow the spectrophotometer to warm up for at least 20 minutes.
- B. Record the remaining disk space on the hard drive. Verify that the hard disk has at least 100 MB of free disk space. Do not use if less than 100 MB remain.
- C. Perform an analysis of the testmix. Verify use of the parameters as listed in the 'Instrumental Conditions' section. Fill a cuvette with the testmix. Start the analysis.

- D. Use 'Find Peaks and Valleys' to label max and min. Evaluate the results using the 'Acceptance Criteria' section. Print the absorbance spectrum of the testmix with the y-axis scale ranging from 0-1 Absorbance Units.
- E. If all requirements are within specification, prepare the documentation as outlined in IOSS-701. If any requirements fail, contact appropriate instrument support personnel.

6 INSTRUMENTAL CONDITIONS

6.1 UV/Vis Spectrometer

Start:	360 nm
End:	220 nm
Data Interval:	0.5 nm
Scan Speed:	120 nm/min
Band Width:	1.0000 nm

7 ACCEPTANCE CRITERIA

7.1 Testmix

- A. Compare the daily testmix to a previous analysis. The spectrum should be consistent with the previous analysis.
- B. The absorbance spectrum is acceptable if the following are within a ± 1 window of the expected absorbance wavelength:
Max = 272 nm, Min = 245 nm

8 LIMITATIONS

Only properly trained personnel will perform duties involved in the operation, maintenance, or troubleshooting of this instrument.

9 REVISION HISTORY

Revision	Issued	Changes
03	07/15/2022	Revised to match new format requirements. No other substantive changes to content.
04	11/15/2022	Section 2- Updated Scope to remove location. No other substantive changes to content.