Forensic Chemistry Section



Microspectrophotometer Policy

1. <u>Scope</u>

This document outlines the policies governing the use of the microspectrophotometer, which is an instrument for the comparison of color.

2. <u>Policies</u>

- 2.1 For mounted preparations, a minimum amount of mounting media should be used creating a thin, flat, void free preparation.
- 2.2 Specimen mounting media must have low to negligible visible fluorescence.
- 2.3 Known sample selections should represent the complete range of colors represented in the known source.
- 2.4 Known fiber samples must be well separated.
- 2.5 All known samples will be prepared the same as the questioned samples.
- 2.6 The xenon lamp will be turned on prior to the detector head.
- 2.7 Before checking the calibration and use, all components should have a warm-up period of approximately 30 minutes.
- 2.8 Wavelength and photometric accuracy must be performed prior to any casework or regularly, if the instrument has not been used.
- 2.9 The calibration is checked using NIST certified filters including holmium oxide, didymium, and neutral density filters (0.1, 0.5, 1.0). The holmium oxide and didymium filters are analyzed in transmittance with the neutral density filters analyzed in absorbance.
- 2.10 The instrument automatically produces wavelength and photometric accuracy reports following the calibration checks. Multiple wavelengths are evaluated to determine if the instrument passes within certain tolerances. If the instrument is out of calibration a quality assurance reporting form will be generated.
- 2.11 Calibration checks are generally obtained using the 15X objective and the parameters set accordingly.
- 2.12 Calibration check reports must be maintained and include the date, system parameters, and original output data. The calibration reports are maintained within the laboratory.



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- 2.13 Parameters for reference scans must be identical to the parameters used for the sample scans.
- 2.14 Detector sensitivity must be set at the maximum blank energy transmission wavelength of the system in the scan region of interest.
- 2.15 The operator will scan the wavelength region from 400 to 900 nm.
- 2.16 Both diffusers should be placed in front of the xenon lamp.
- 2.17 The microscope should be aligned using Kohler illumination prior to analysis.
- 2.18 The iris should be set as follows:

15X objective	1.4
36X objective	2.5

- 2.19 Sample scans should be run under the same conditions as those used for system reference scans.
- 2.20 Samples should be focused and centered on the optical axis of the system.
- 2.21 Measuring sites should be chosen to avoid obvious inhomogeneity occurring within the area being chosen.
- 2.22 Ten scans per sample are usually sufficient to allow for a representative sample.
- 2.23 Spectral records must bear a case number, item number, date, name of operator, and operating parameters.
- 2.24 The data will be backed-up by moving a copy of the data to the laboratory network drive at the end of each day of use.
- 2.25 Spectral files will be saved with each scan.
- 2.26 When analyzing data, the position of the peak maxima, peak width, and peak intensity must all be considered.
- 2.27 The instrument will be cleaned on a regular basis.
- 2.28 The instrument operations manual is located in the laboratory space near the instrument.

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2.29 The instrument is maintained in the secure access portion of the laboratory. Should the instrument require storage or transportation, the laboratory will contact the manufacturer for guidance.