VIII. Conclusions

This method allows for reproducible extraction and quantitation of Δ^9-Tetrahydrocannabinol from plant material samples. Use of gas chromatography mass spectroscopy (GC/MS) will not allow for distinction between Δ^9-Tetrahydrocannabinol (THC) and Δ^9-Tetrahydrocannabinolic acid (THC-A). The newly developed method for our GC/MS instruments will separate and distinguish from a number of other cannabinoids, permitting qualitative analysis in conjunction with quantitative analysis.

During this validation the importance of instrument maintenance was exhibited on multiple occasions. Three separate times, a dirty or slightly clogged autosample syringe impacted results negatively. Injection port liners get dirtier with extracts from botanical samples, and dirty liners can easily affect quantitation results. During one experiment a filament went out and changing the filament in the software led to a change which precluded useful interpretation of the results. The Forensic Chemistry Unit is use to qualitative analysis and will have to adjust or be more diligent with instrumental conditions for quantitative analysis.

Qualitative analysis of THC requires very little extraction time and often has to be diluted significantly to avoid overloading the instrument. However, in quantitative analysis it is important to achieve high extraction efficiency in order to accurately measure all of the analyte present in an exhibit. The extraction procedure may seem extreme and analyst might be tempted to reduce the time or vigor with which samples are extracted, however, this will lead to inaccurate results.

Marihuana samples and hemp samples should differ greatly in their respective THC concentrations. Marihuana samples are expected to have concentrations greater than the highest standard used in this method. If quantitation of these samples is necessary, then they will need to be diluted into the proper range for our calibration curve. Demonstrating that these samples are well above the legally significant amount (0.3 %) might be sufficient for our purposes.