Application Note 106: Analysis of Latex Content of Rubber Plant Sap using an NIT-38 Analyser.

Introduction:

Determining the latex content of rubber tree sap is important for the ongoing production of rubber. A quick, reliable and non-destructive means of testing the latex content of the sap would allow buyers to pay farmers for the latex content of the sap..

This study was undertaken to demonstrate the feasibility of measuring latex content in the sap from rubber plants using the NIT-38 Near Infrared Transmission Analyser.

Procedure:

Six samples of liquid sap were acquired from Malaysia. The samples were scanned using a 5mm and a 10mm pathlength liquid cell. The optimum light throughput was achieved with the 5mm pathlength cell.

The samples were stabilised at room temperature (24 degrees centigrade) along with the NIT-38 Transmission Analyser for one hour.

The samples were then scanned over the wavelength range of 720nm to 1100nm collecting 10 scans per sample using the 5mm pathlength cell. A small amount of the sample was used to clean the cell prior to sampling.

The resultant spectra were uploaded into NTAS (NIR Technology Australia Software) and Partial Least Squares Regression (PLS) was used to develop a trial calibration for Latex.

Results:

Figure 1, below, shows the NIT spectra, over the wavelength range of 720nm to 1100nm, for the six samples of sap.

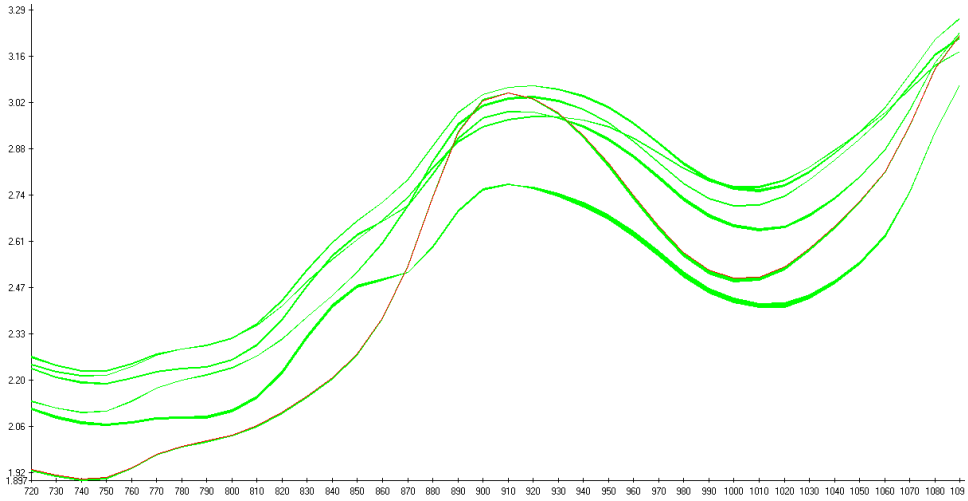

Figure 1: Plot of NIR Spectra for rubber plant sap.

Figure 2 shows the calibration statistics for the NIR latex values versus the reference latex values. The Standard Error of Calibration is 0.20% with a correlation (R^2) of 0.99.

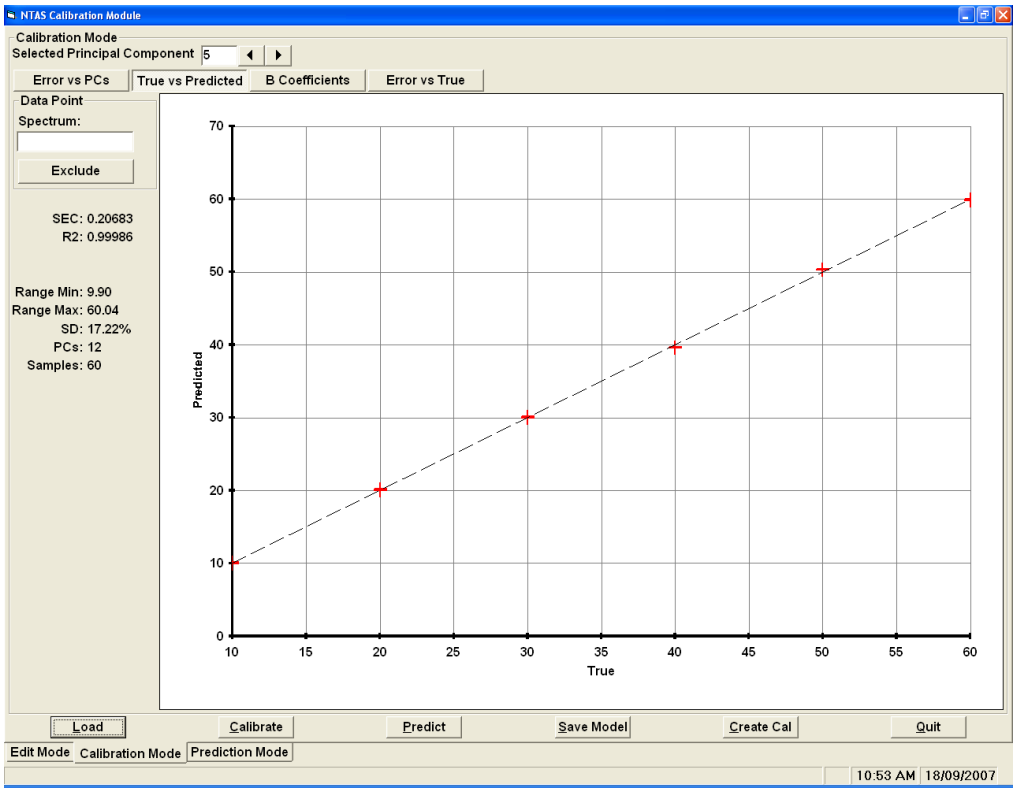

Figure 2: Plot NIR Predicted latex value vs. Reference latex value.

Conclusion:

It can be seen from figures 2 that the NIT-38 Analyser can be calibrated to measure the latex values of rubber plant sap. Whilst the sample set is insufficient to develop a robust calibration, it is still sufficient to demonstrate the feasibility of this method. With addition of more samples a reliable and robust calibration could be produced.

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