

Introduction

NIR spectroscopy (Near Infrared Spectroscopy) is a technique that uses the material specific absorption of near-infrared electromagnetic spectrum (typically between 750-2500nm) in return creating a unique and identifiable fingerprint spectroscopy. The sample is placed in the path of a beam of NIR light, and the amount of light that is absorbed or transmitted is measured. The absorption or transmission spectrum of the sample is then compared to a reference spectrum to determine the chemical composition of the sample. Black coloured plastics regardless of its composition absorb the entire spectrum and cannot be identified by NIR. As this is a surface measurement method, samples must be free of dirt and completely dry; water and dirt may falsify the reflected spectrum.

Before Starting

Step			notes
1	Open the App	×	Open TrinamiX Spectroscopy app username: password:
2	Turn on the Spectrometer		Press the button on the Scanner until LED lights up green
3	Synchronise	Home - Plastics PRO Image: Connect a spectrometer to start measuring	Connect the Spectrometer with the App. Choose the material category "Plastics PRO". Bluetooth activated.
4	Calibration		 Scan in the plain air Scan white calibration standard (in the back of the Spectrometer)
5	Campaign set up		Define a suitable set, campaign and name for data backup and identification.

Materials and Equipment

- NIR Spectrometer
- Samsung A13 with trinamiX App
- Sim Card
- White Standard

Maintenance

- Clean the scanner after use
- Check for damage and completeness
- Fully charge the scanner and phone after use
- Regularly check results with standard samples



Processing

Step			notes	
0	Before Starting		Make sure you have completed "Before Starting"	
1	Preparation		Only Process clean and dried samples	
2	Scan process		Hold the scanner straight on the sample, press scan button (Spectrometer or app)	
3	Results	Results PS Material: PS Confidence: high Date Time 1/17/2023 4:41:27 PM Results Outlier: Outlier: Irregular spectral shape	 Results are displayed in the app (online): 1. Material is detected directly 2. Unrecognized material 3. Irregular spectral space 4. Insufficient contrast 	
4	Correction		 In case of 2. Repeat scan (max. 3 times), sample might contain mix of materials, dirt or is not listed in database 3. Repeat scan (max. 3 times), sample might be too dark and absorbs the infrared 4. Use white standard and fold sample to decrease transparency (max. 3 times) If no results can be obtained, proceed as "unidentifiable" 	
5	Data Docu- mentation		 Data documentation sheet for real time documentation Number of pieces Total weight of material category 	
5	Pack up		Turn off the scanner (long press). Proceed with documentation and maintenance.	



Data Download

Step			notes
1	Login in Browser	▲ 🖻 Language 🌱 🛛 Sign In	Sign in <u>https://nirs.trinamixsensing.com/</u> username: password:
2	Access Data	Filter By Date 1/11/2023, 1:50 pm	My Data -> Applications (Plastic Pro) Filter by Date and time, results per page
3	Synchronise	Download (10) Actions Measurement Date 1 Interference	Select measurements for download
4	Choose file format	Excel (.xlsx)	Choose either .xlsx or .csv according to preference
5	Select data range	ビ Include Spectra	Include spectra and wavelength unit (nm or cm ⁻¹)