



# Introduction

A method for identification of paracetamol in a tablet formulation by Fourier Transform Infrared Spectroscopy (FTIR) using a Diamond ATR.

A tablet of paracetamol is crushed using a mortar and pestle into a fine powder. The paracetamol is detected using DLATGS detection and a similarity search is conducted to provide a comparison against a known reference standard.

#### **Materials**

Paracetamol	-	Harmful if ingested in quantity; irritant; reproductive effects
Isopropyl Alcohol	-	Harmful if ingested; irritant; reproductive effects

### Safety

Avoid skin and eye contact with reagents by wearing a lab coat, gloves and safety glasses. Do not expose to a source of ignition. Avoid inhalation of IPA vapor.

Provided the recommended precautions are adopted, the risk to operators during this procedure is minimal.

#### Apparatus

IRSpirit-X FTIR Spectrometer Paracetamol Tablets Mortar and Pestle Sampling Spatula Isopropyl Alcohol

### **IRSpirit-X Parameters**

Measurement Mode:	% Transmittance
Apodisation:	Happ-Genzel
No. of Scans:	32
Resolution:	4cm <sup>-1</sup>
Range (cm <sup>-1</sup> ):	4000-400

# Preparation of sample (tablet) powder:

You are provided with 20 tablets (each tablet contains 500 mg of paracetamol). Using a calibrated balance, weigh one tablet and record the weight. Using the mortar and pestle, crush each tablet into a fine powder with uniform particle size.



### Analysis of tablets:

- 1. Ensure the diamond puck is clean and free from contamination. If needed wet a clean tissue with IPA and clean the puck, allowing the solvent to evaporate.
- 2. Open Spectrum from LabSolutions™ IR.
- 3. Connect the IRSpirit to Spectrum using the [Instrument] Drop Down menu, clicking [Connect].
- 4. Set method parameters as per [IRSpirit-X Parameters].
- 5. Insert your file name and sample name in the sample labelling section.
- 6. Select [BKG Scan] ensuring nothing is on the crystal.
- 7. Once completed, add a small amount of sample to cover the crystal and clamp the sample in place.
- 8. Select [Sample Scan] to produce a spectrum.
- To conduct a Similarity Search, click on [Search] (Binoculars button) and then click on [Spectrum Search] – LabSolutions IR will compare the scanned sample to the libraries.
- 10. Select [Fix Search Result] to append the results to the sample file and select [Save]
- 11. Print to a reporting template by selecting [Print].

Model report for the assay of paracetamol in tablets

### Investigated compound:

Paracetamol

C<sub>8</sub>H<sub>9</sub>NO<sub>2</sub>

151.16 g·mol<sup>-1</sup>



# Standard:

Substance: Paracetamol – Analytical gradeManufacturer: Sigma-AldrichBatch No.:73498564354319Expiry date:05.2018

# Sample:

Paracetamol tablets containing 500 mg paracetamol per tablet Manufacturer: Bayer pharmaceuticals Batch No.: 87090ßß Expiry date: 09.2017

#### **Results:**

Each sample was analyzed compared against a reference library using the spectral search function in LabSolutions IR. A hit quality index (HQI) for each sample was produced and a score was produced for each sample.



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### **Conclusion:**

A score for one sample was 950/1000 which indicates the tablet that was analyzed was a paracetamol containing. The score of 950 represents an excellent match to a reference standard in the standards library, increasing the confidence the samples are paracetamol.