

Method 1: CaF₂ Cell Beer's Law

The sample which has been diluted with cyclohexane is introduced into a CaF₂ (Figure 1) cell and the mid infrared absorption spectrum is recorded. The absorbance of the typical absorption band for esters at about 1745 cm⁻¹ is measured. The biodiesel content is then calculated with a calibration function produced from standard solutions with a known biodiesel content.

Method 2: FTIR-ATR-PLS

The sample is introduced into a liquid attenuated total reflectance (ATR) sample cell (Figure 2). A beam of infrared light is imaged through the sample and the detector response is determined. Wavelengths of the absorption spectrum that correlate highly with biodiesel or with interferences are selected for analysis. Detector response for the selected areas of the spectrum is converted by a multivariate mathematical analysis to the biodiesel content.

Amount of sample required: 5 ml
Cost of analysis: RM 200 per sample*

Note: * As at June 2010; subject to change.

REFERENCES

EUROPEAN COMMITTEE FOR STANDARDIZATION (2003). *EN 14078:2003 Liquid Petroleum Products – Determination of Fatty Acid Methyl esters (FAME) in Middle Distillates – infrared Spectroscopy Method.*

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) (2007). *ASTM D7371-07 Standard Test Method for Determination of Biodiesel (Fatty Acid Methyl Esters) Content in Diesel Fuel Oil Using Mid Infrared Spectroscopy (FTIR-ATR-PLS Method).*



Figure 1. Fourier transform infrared (FTIR) spectrometer with a CaF₂ sample cell.

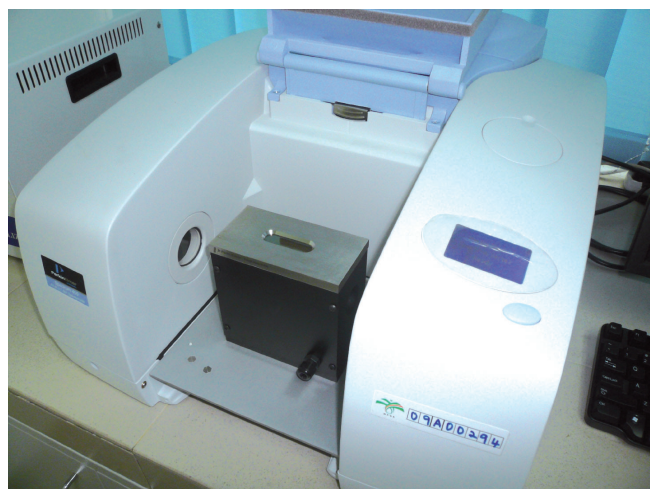


Figure 2. Fourier transform infrared (FTIR) spectrometer with attenuated total reflectance (ATR) sample cell.

For more information, kindly contact:

Director-General
MPOB
P. O. Box 10620
50720 Kuala Lumpur, Malaysia.
Tel: 03-8769 4400
Fax: 03-8925 9446
www.mpob.gov.my