

A RAPID METHOD FOR DETERMINATION OF OIL RESIDUE IN METHYL ESTERS

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Methyl esters are prepared via two routes, *i.e.* transesterification of vegetable oils with methanol or esterification of fatty acids with methanol. The former is the more common method, but the reaction may be incomplete leaving some residual oil with the methyl esters. This oil, or oil residue, should be monitored and preferably removed to produce high quality methyl esters. Gas chromatography is commonly employed to detect oil residue in methyl esters but the technique requires a long time.

In view of the importance of this analysis, MPOB has developed a more rapid alternative method.

NEW METHOD FOR DETECTING OIL RESIDUE IN METHYL ESTERS

The new rapid method to detect oil residue in methyl esters uses near infra-red spectroscopy (NIR) (Figure 1), as summarized below:

- sample melted;

- NIR instrument calibrated by spiking methyl ester with palm oil (PO), or palm kernel oil (PKO), in the range 0.1% to 10.0%. The methyl ester can be palm oil-based or palm kernel oil-based;
- the square of the correlation coefficient of the spiked PO or PKO methyl esters and the readings predicted by the instrument is established;
- good correlation coefficients ($R^2 > 0.985$) between the spiked PO methyl ester and unspiked PO methyl ester and the readings predicted by the instrument at two different NIR regions were achieved;
- the limit of detection for PO residue in PO methyl esters is 0.5%;
- good correlation coefficients (R^2 ranging from 0.992 - 0.993) between the spiked PKO methyl ester and unspiked PKO methyl ester and the readings predicted by the instrument at two different NIR regions were achieved;
- the limit of detection for PKO residue in PKO methyl esters is 0.5%; and
- after the calibrations are established, the determination of both PO and PKO residues in methyl esters can be done in a few minutes.



Figure 1. Near infra-red (NIR) spectroscopy equipment for determination of oil residue in methyl esters.

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ANALYTICAL AND CONSULTANCY SERVICES

MPOB offers the service for detecting oil residue in methyl esters using the new method on the following terms:

- the client to send his sample(s) (about 25 g) with a written request for the test required;

- the results in a certificate of analysis (COA) to be ready in three days with the invoice sent together; and
- cost of analysis.
 - more than 10 samples - RM 15 per sample.
 - less than 10 samples - RM 20 per sample.

MPOB may also assist interested companies to set up the test in-house.

For more information kindly contact:

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