DETERMINATION OF ALCOHOL BOTTOM AND ESTER BOTTOM IN CRUDE PALM KERNEL OIL

by: MOHTAR YUSOF

355

MPOB INFORMATION SERIES • ISSN 1511-7871 • JUNE 2006 MPOB TS No. 14

Alcohol bottom is a by-product, or distillation residue, from the production of C8-C18 fatty alcohols while ester bottom is a by-product or distillation residue, from the production of C8-C18 methyl esters. They can be used to adulterate crude palm kernel oil (CPKO), one of the feedstocks used for the production of oleochemicals.

MPOB has developed a rapid technique to detect adulteration of CPKO by alcohol bottom and ester bottom.

IMPORTANCE OF DETERMINING ALCOHOL BOTTOM AND ESTER BOTTOM IN CPKO

- Adulteration (if any) will badly affect the quality of the oleochemicals produced.
- The presence of these by-products in CPKO should be monitored on delivery, and a rapid technique for detection is therefore necessary.

ALCOHOL BOTTOM AND ESTER BOTTOM TESTING SERVICES

- Currently, there is no official method to detect alcohol and ester bottom contamination in CPKO.
- A new rapid method for detecting alcohol bottom and ester bottom in CPKO has been developed using near infra-red spectroscopy (NIR) (*Figure 1*).

SERVICES PROVIDED

Consultancy Service

- MPOB may assist company to set up the test in house. For more information, please contact the Director-General.

Figure 1. Near infra-red spectroscopy for determination of alcohol bottom and ester bottom in CPKO.

ISSN 1511-7871
9 771511 787001

Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities, Malaysia
P.O. Box 10620, 50720 Kuala Lumpur, Malaysia. *Tel*: 03-89259155, 89259775 *Website*: http://mpob.gov.my *Telefax*: 03-89259446

MPOB

Analytical Service

- MPOB offers the detection of alcohol bottom and ester bottom in CPKO using the new method as a service to the industry.
- Any company suspecting adulteration may send the samples (about 25 g) with a written request for the test required to be done.
- The results will be ready in three days, and will be sent together with the invoice for payment.
- Cost of analysis:
  - More than 10 samples - RM 15 per sample.
  - Less than 10 samples - RM 20 per sample.

PRINCIPLE OF METHOD DEVELOPED

- The sample is melted to homogenize it.
- The calibration of alcohol bottom or ester bottom added to CPKO in the range of 0.1% to 10.0% is carried out.
- The correlation coefficient (R^2) of the added alcohol bottom or ester bottom predicted by the instrument is established.
- The correlation coefficients of the added alcohol bottom and those predicted by the instrument are good, ranging from 0.986-0.993 at three different NIR regions.
- The correlation coefficient of the added ester bottom and those predicted by the instrument is also good, *i.e.* 0.997 at whole NIR range.
- The limit of detection for alcohol bottom or ester bottom in CPKO is 0.5%.
- After the calibration is established, the determination of alcohol bottom and ester bottom in CPKO can be done in a few minutes.

For more information kindly contact:

Director-General
MPOB
P.O. Box 10620
50720 Kuala Lumpur. Malaysia.
Tel: 03-89259155, 89259775
Website: http://mpob.gov.my
Telefax: 03-89259446