

PRODUCT DEVELOPMENT AND CRYSTALLIZATION SIMULATION USING METTLER LABMAX REACTOR WITH FBRM™ SYSTEM

by: CHONG, C L; ZALIHA OMAR; ZUKARINAH KAMARUDDIN; ROZIYAH AHMAD and JORIAH PUTEH

353

MPOB INFORMATION SERIES • ISSN 1511-7871 • JUNE 2006

MPOB TS No. 12

I ncreasing pressure to bring novel specialty compounds to market has initiated the automation of laboratory reactors to perform controlled experiments at laboratory scale which can be easily scaled-up. Product and process developments in the shortest time to produce the first kilogramme of compound for commercial evaluation is of utmost importance.

The LabMax reactor is a computer controlled, automatic lab reactor for the synthesis and kilogramme scale-up labs in chemical research, physical characterization, and process and product development (*Figure 1*). This compact instrument can be operated 24 hr a day. Basic operations such as stirring, heating, cooling, dosing, pH-stating, distillation and refluxing, as well as crystallization can be pre-programmed

and run automatically. The entire experiment is stored and can be reproduced whenever needed.

HEATING AND COOLING

A quick-acting thermostat controls the jacket temperature (T_j) or the temperature of the reaction mass (T_f) in a ramp or to a constant value. The rapid and efficient cooling enables reactions to be run safely even if they are highly exothermic.

MIXING AND STIRRING

While the reaction mass is normally mixed with a glass anchor or propeller stirrer, other types of stirrers can also be used (*Figure 2*). In addition to the stirrer speed, a characteristic value for the viscosity of the reaction mass is displayed and recorded.



Figure 1. LabMax - the laboratory reactor for the automation of lab syntheses.

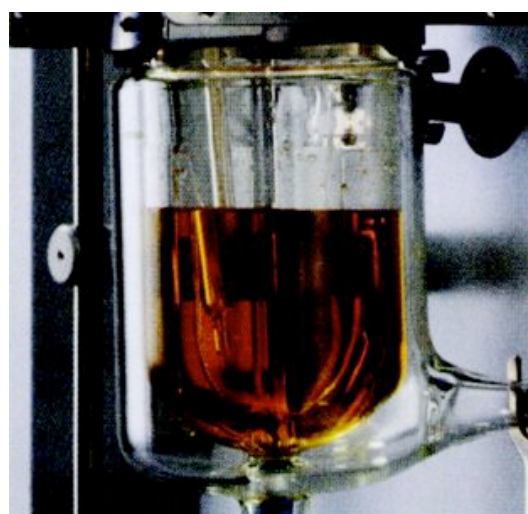


Figure 2.

ISSN 1511-7871



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



MEASURING AND RECORDING

During the automatic execution of a synthesis run, analytically measured variables can also be recorded to observe the ongoing reactions. A new type of probe for FTIR measurements shows the extent of disappearance or formation of the reactants, intermediates and final products.

LASENTEC PROBES

Lasentec's FBRM™ probes can be interfaced for online particle size and dimension analysis to gain a better understanding of the crystallization process, polymorph formation or suspensions (Figure 3).

WHAT CAN THE LABMAX REACTOR BE USED FOR?

The Labmax reactor and Lasentec detecting system can be used for:

- simulation of fractionation process for crystallizer design;
- product development from special fractionation process;
- oleochemical development using a controlled reactor for oleochemical reaction via controlled dosing, temperature control, *etc.*
- Precise control of processing parameter with good scale-up; and
- research/preliminary work on process development.

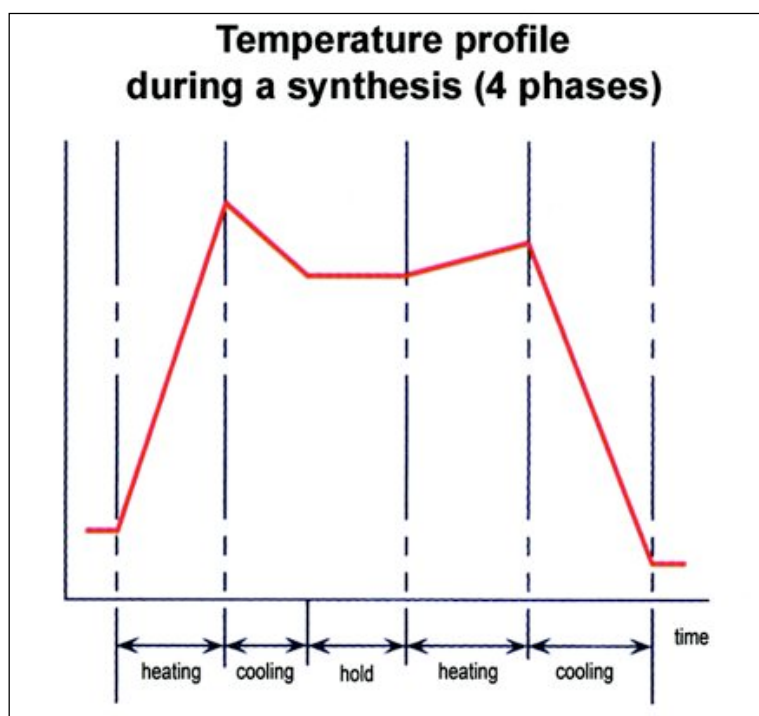


Figure 3.

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