

National University of Science and Technology Zimbabwe



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Faculty of Applied Sciences

Department of Applied chemistry

Product Design and Development Project

Titled

**Investigating the suitability of the use of Toximul Range of Emulsifiers As
Possible Replacement For Emulsogen EL in the Formulation of Dimethoate
40EC Insecticide.**

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY ZIMBABWE		
DATE	ACCESSION	CLASS
16/05/07	1823	RES QP MS

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A Dissertation Submitted in Partial Fulfillment of the Bachelor of Science

Honours Degree In Applied Chemistry

May 2006

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ABSTRACT

The dissertation is based on emulsifier replacement in the formulation of Dimethoate 40EC, an organophosphorus insecticide formulated as an emulsifiable concentrate (E.C) at Agricura Private Limited. A six-stage approach was followed in which the first stage involved selection of the emulsifier(s) using hydrophilic-lipophilic balance (HLB) values of the available emulsifiers. The emulsifier hydrophile-lipophile ratio and the emulsifier composition in the formulation were optimized leading to pilot formulation. Pilot formulation stage was aimed at assessing the performance of the new formulation against stated standards and precedent formulation that used Emulsogen EL. The fifth stage was heat or accelerated storage stability test aimed at assessing product shelf life. Last but not least, suitable packaging material for the formulation was determined and tested. This necessitated large-scale batch formulation, from which samples for field tests were collected. Currently, the product is under field and real time storage test to assess field performance and actual shelf life.

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