

# **BIOPROCESSING OF LACTIC ACID BY FERMENTATION TECHNIQUE**

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**IIUM  
Press**

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Published by:  
IIUM Press  
International Islamic University Malaysia

First Edition, 2011  
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Maizirwan Mel  
Bioprocessing of Lactic Acid by Fermentation Technique / Maizirwan Mel ... [et al.].  
978-967-418-093-5

ISBN 978-967-418-093-5

Member of Majlis Penerbitan Ilmiah Malaysia - MAPIM  
(Malaysian Scholarly Publishing Council)

Printed by:  
IIUM PRINTING SDN. BHD.  
No. 1, Jalan Industri Batu Caves 1/3,  
Taman Perindustrian Batu Caves,  
Batu Caves Centre Point,  
68100 Batu Caves,  
Selangor Darul Ehsan

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# Chapter 12

## Optimization of Process Parameters Using Response Surface Design on Distribution Coefficient of Lactic Acid

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Nur Syahida, Raha Ahmad Raus*

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### Abstract

This chapter discussed about the optimization of process parameters using response surface design on the distribution coefficient of lactic acid. The persistent demand of pure and naturally produced lactic acid in food and beverage applications attracted researcher's interest towards process development for maximum recovery of lactic acid from fermentation broth. The paper presents the characteristics of Triisooctyl amine extractant for reactive lactic acid extraction. The reactive extraction method was developed to separate lactic acid from its aqueous solution. In this method, the amine in the solvent phase reacts with the lactic acid in the aqueous phase, resulting in the extraction of acid into the organic phase, which was determined by distribution coefficient of lactic acid. Triisooctyl amine was used as the solvent with 1-decanol as a diluent. Optimization of process condition was done with different values of initial lactic acid concentration, pH, stirring rate, the amount of Triisooctyl amine in 1-decanol, and the ratio of organic phase volume to aqueous phase volume,  $V_{org}/V_{aq}$ . The effects of all those parameters on the distribution