

**DEVELOPMENT OF EQUIPMENT SELECTION TOOL FOR
PHARMACEUTICAL NANOEMULSION PRODUCTION**

By

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in

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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Nanoemulsions are kinetically stable liquid-in-liquid dispersions with droplet sizes in the range of 20 – 200 nm. Their small size leads to useful properties such as high surface area, robust stability, and optically transparent or translucent appearance. Nanoemulsions are applied in diverse areas such as drug delivery, food, and cosmetics. There are currently four types of mechanical equipment used to prepare nanoemulsions, including high-pressure homogenizer, microfluidizer, ultrasonic homogenizer, and rotor-stator homogenizer. As improper selection of equipment contributes negative effects to the overall performance of manufacturing process i.e. the speed, quality of product, and production cost, the selection of proper equipment becomes an important issue. Based on that reason, an equipment selection tool for nanoemulsions is developed to help manufacturers in selecting the most suitable equipment based on their requirements. The equipment selection tool built in the form of flowchart diagram that consists of four questions relating to the four critical criteria affecting the equipment selection. By following the questions, user could obtain the information of recommended equipment. Moreover, validation was done to ensure the tool could perform its desired function consistently.

Keywords: Nanoemulsion, High-pressure homogenization, Microfluidization, Ultrasonication, Rotor-stator homogenization, Equipment selection tool

Jesslyn Nasthasja Kosasih



DEDICATION

I dedicate this works to God and my family.



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