EPOXIDATION OF RUBBER SEED OIL BASED LINOLEIC ACID

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APRIL 2015

ACKNOWLEDGEMENT

In preparing this report, I am very thankful to Allah S.W.T for giving me strength, mentally prepared and time to complete this study. Besides that, I also want to thank to my beloved parents, Encik Ali bin Hj Sulaiman and Puan Siah binti Md Nawi that never giving up for supporting me, giving me advice and provide me with unlimited financial.

I would like to sincerely thank to my supervisors, Cik Siti Khatijah binti jamaluddin and Dr Ahmad Rafizan bin Mohamad Daud for giving me guidance throughout my study and especially for his advice and encouragement to finish this study. Without their guidance, I am sure this study would not be completed in the given time.

Besides that, I also would like to thank you to all of those who have given me help and advice either direct or indirect in my study.

Thank you so much.

ABSTRACT

The purpose of this study is to utilize epoxidize rubber seed oil based linoleic acid for industrial uses as this vegetable oil finds sustainable and renewable source of raw material. The unsaturation present can be chemically modified to a value added product by a complicated reaction called 'epoxidation'. Due to the high reactivity of the oxirane ring epoxides can also act as a raw material for synthesis of variety of chemicals such as alcohols (polyols), glycols, olefinic compounds, lubricants, plasticizer and stabilizer for polymers and their demand is increasing day by day. They are great concern as they are obtained from suitable, renewable natural resources and environmental friendly. To get the high conversion of complete epoxide , a design of experiment was used to optimized the parameter that been considered. Analytical Taguchi method was used in this design of experiment. By using a data given, a set of orthogonal array of experiment was made to determine which level of parameter give the highest epoxidation conversion yield. There are four parameter that are been consider to optimized the yield of complete conversion oxirane (epoxide). The parameters are effect on mole of formic acid to linoleic acid, effect on mole of hydrogen peroxide to linoleic acid, catalyst loading and reaction temperature. The highest yield of complete conversion of epoxide is 88%. The result was obtained when the reaction temperature at 50°C , the mole ratio of formic acid to linoleic acid used is 1:1, the mole ratio of hydrogen peroxide to linoleic acid is 1.25:1 and lastly 1.0 g of sulphuric acid was used this this overall process.

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