

EPOXIDATION OF RUBBER SEED OIL BASED LINOLEIC ACID

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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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