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| <b>Title (6)</b>              | : | <b>Epoxidation of oleic acid derived palm oil and subsequent ring opening by in situ hydrolysis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>Abstract</b>               | : | <p>With the increasing focus on sustainable development, the exploration of renewable and environmentally friendly resources for product synthesis has become paramount. This study aims to investigate the production of dihydroxystearic acid through the in situ hydrolysis of epoxidized oleic acid. Epoxidation of oleic acid was achieved through the utilization of in situ generated performic acid, resulting in the production of epoxidized oleic acid. The synthesis of performic acid involved the combination of formic acid as an oxygen carrier and hydrogen peroxide as an oxygen donor. A maximum epoxide yield of 65% was attained at an optimum reaction time of 30 min. Hydrochloric acid was found to be the most efficient catalyst. A kinetics study was also done using the genetic algorithm to find the reaction rate of dihydroxystearic acid production. The difference between simulation and experimental results was less than 0.1%, which is insignificant. The findings highlight the potential of utilizing renewable resources for the synthesis of high-value compounds, promoting a greener and more sustainable future.</p> |