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Synthesis of alkydic resins by enzymatic alcoholysis

Andreia de Araújo Morandim Giannetti and **Renata Carvalho**
Centro Universitário da FEI, Brazil

During the development of alkyd resin, parameters as acid value, the index saponification and medium molar mass of soybean oil were first determined. After that, the best solvent to be used during the alcoholysis step was established by comparing and determining the enzymatic activity of Lipozyme 435 enzyme in the presence of hexane, water, tetrahydrofuran and tert-butanol. Then, alcoholysis was performed using different concentrations of enzyme, oil/glycerin relations and temperature, to determine the best reaction conditions for obtaining the greatest concentration of monoacylglycerides and diacylglycerides. All samples were analyzed using CLAE and the results were evaluated in Statistica 12.0 program. After analysis of data, it was obtained as optimal reaction conditions a 9.36% concentration of enzyme, a weight ratio glycerol/oil of 1:3.5 (w/w) and a temperature of 56.73 °C. During the final step of obtaining resin, solvents were added (xylene and mineral spirit) and phthalic anhydride in specified amounts to give the resin at the end of the process viscosity characteristics and acid index as specified, without differences in the application of the usual resin produced by chemical catalyst. It was studied further the recovery of the enzyme, their reuse in the process and, consequently, cost savings, besides reducing solid waste generation, verifying that it showed significant amounts of enzyme activity after use and recovery.

Biography

Andreia de Araújo Morandim Giannetti has completed her PhD at Paulista State University and Postdoctoral studies from the same. She is a teacher at the FEI University Center. She has published more than 18 papers in reputed journals and has been serving as a reviewer in several renowned journals.

preamorandim@fei.edu.br

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