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Solvent-free biodiesel epoxidation

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Biodiesel is comprised of esters that are derived from the trans-esterification of oils and fats with alcohols and has emerged in recent years as a great potential complementary resource to petroleum-based fuels and derivatives. Currently, vegetable oil derived does not have the same importance as fossil derivatives in fuel usage; however, the growing significance of these products is undeniable. Besides energy, biodiesel can be used as raw material to synthesize high value products such as epoxides. Indeed, epoxides are versatile intermediates in organic synthesis for numerous reactions due to the high reactivity of the oxirane ring. Actually common epoxidation by peracids in organic solvent can last several hours according to the double bonds number. The solvent confers selectivity to the reaction, preventing di-hydroxylation. Alternatively solvent-free reactions can be done in shorter times, but hydroxylation reactions are less controlled. In this work, we set up the synthesis of epoxides from methyl and ethyl esters of waste cooking oil, without solvent or metal catalyst. Results show that the highest epoxide yields selectivity, with high conversion of the double bonds. Organic solvent suppression, besides being environmentally friendly, also saves reaction time and subsequent purification steps.

Biography

Diego Defferrari has studied chemistry in the Federal University of Rio Grande do sul. He is currently in pursuing graduate degree in Industrial Chemistry and is a Pharmacy student. He has published a couple of papers in biofuels area. He also teaches the best vestibular preparatory courses in the state of Rio Grande do Sul.

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