

Preparation of renewable bio-polyols from two species of *Colliguaja* for Rigid polyurethane foams

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In this study, we investigated the potential of two non-edible oil extracts from seeds of *Colliguaja integerrima* (CIO) and *Colliguaja salicifolia* (CSO) to use as a renewable source for polyols and, eventually, polyurethane foams or biodiesel. For this purpose, two novel polyols from the aforementioned oils were obtained in a one-single step reaction using a mixture of hydrogen peroxide and acetic acid. The polyol derivatives obtained from the two studied oils were characterized by spectral (FTIR, ¹H NMR, and ¹³C NMR), physicochemical (e.g., chromatographic analysis, acid value, oxidizability values, iodine value, peroxide value, saponification number, kinematic viscosity, density, theoretical molecular weight, hydroxyl number, and hydroxyl functionality) and thermal (TGA) analyses according to standard methods. Physicochemical results revealed that all parameters, with the exception of the iodine value, were higher for bio-polyols (CSP and CIP) compared to the starting oils. The NMR, TGA, and FTIR analyses demonstrated the formation of polyols. Finally, the OH functionality values for CIP and CSP were 4.50 and 5.00, respectively. This result indicated the possible use of CIP and CSP as a raw material for the preparation of polyurethane rigid foams. © 2018 by the authors.

Bio-polyol

Colliguaja integerrima

Colliguaja salicifolia

Renewable resources

Vegetable oil

Chromatographic analysis

Density functional theory

Oxidation

Peroxides

Polyols

Polyurethanes

Rigid foamed plastics

Vegetable oils

Bio-polyol

Colliguaja integerrima

Colliguaja salicifolia

Hydroxyl functionality

Polyurethane rigid foams

Renewable resource

Rigid polyurethane foams

Saponification numbers

Alcohols