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VALORIZATION OF PEANUT SHELLS: MANUFACTURE OF BIOACTIVE OLIGOSACCHARIDES

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HIGHLIGHTS

- Peanut Shells (PS) were tested for bioactive compounds obtention for the first time.
- Autohydrolysis is efficient to recover oligosaccharides and antioxidants from PS.
- The refined oligosaccharides were characterized by HPLC, MALDI TOF MS and FTIR.
- Environmentally friendly technologies were used to valorize peanut shells.

Abstract

Peanut shells were subjected to non-isothermal aqueous treatments to cause the partial breakdown of hemicelluloses into soluble oligosaccharides and lignin-derived compounds with high antioxidant activity. The effects of temperature on the chemical composition of the substrate and soluble reaction products were assessed. Under selected conditions (210 °C, severity =4.09), the overall amount of poly- and oligo- saccharides present in the liquid phase reached 9.8 g/L. This solution was refined by consecutive stages of discontinuous diafiltration, yielding a refined product containing about 72.4 wt % of oligomers at a global yield of 8.5 kg/100 kg oven-dry PS. The purified products were characterized by HPLC, MALDI-TOF-MS and FTIR, confirming the major reaction products were saccharides made up of xylose with degrees of polymerization up to 17, substituted with acetyl and methylglucuronosyl groups, for which a number of pharmaceutical and food applications have been proposed. Solubilization of hemicelluloses in the treatments resulted in the production of solids enriched in cellulose and lignin suitable for further applications.

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