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Hemicelluloses Fractions Extraction of Corn Residue

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Lignocellulosic materials are the most abundant material in the world. Its sources range from trees to agricultural residues. Nowadays, these materials are not just used in their old ways (firewood, building materials and animal food). For example, cellulose, which is a major chemical constituent of lignocellulosic materials, can be used for fibers in the textile industry; hemicelluloses can be used as polymers for chemical and pharmaceutical applications while lignin can be used as an adhesive component in the composite industry. However, some of these applications are limited by the close association that exists among these three main components. The objective of this study was to determine the efficacy of the extraction of hemicelluloses fractions of corn residues by an alkaline process. Samples of corn cob were treated with NaOH solution (0.25 to 0.75 mol.dm³) for 2 h at different temperatures (30 - 80 °C). After the indicated period of treatment, the samples were acidified to pH 5 with glacial acetic acid, concentrated under reduced pressure, and then filtered. The alkali-soluble hemicelluloses were then precipitated by pouring the concentrated supernatant fluid with four volumes of 95 % ethanol (20 °C, 24 h). The precipitates were recovered by filtration, washed with 70% ethanol, and air dried. The treatment of corn cob with 0.25 mol.dm³ and 0.75 mol.dm³ NaOH at 30 °C for 2 h released 3.2 and 11.7 % hemicelluloses, respectively (% dry starting material). Thus, these results revealed that the extraction of the corn cob was effective, and that the highest release of hemicellulose was obtained with 0.75 mol.dm³ NaOH. Acknowledgements: FCT (Portugal) and Erasmus Programme