



Council for Scientific and Industrial Research (CSIR)

Natural Resources and the Environment (NRE)

Durban, South Africa

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Title:	Beneficiation of sawdust waste: fractionation of hydrophilic compounds
Abstract:	<p>The bio-refinery approach for bio-mass utilisation is based on the fractionation of lignocellulosics to obtain a variety of marketable chemicals from the polymeric fractions of the raw materials (cellulose, hemicellulose and lignin). In this field, hydrolysis can be conceived as a possible first processing step. The aim of the project is to study the effect of hydrolysis on hardwood and softwood sawdust. Several hydrolysis methods will be used to extract major monosaccharides. The mechanism of chemical hydrolysis is based on the catalytic cleavage of glycosidic bonds in polysaccharides. Various acids can be used as the catalyst, but the most common is sulphuric acid. However, several organic acids such as acetic and formic acids can also be used as catalysts. The selected hydrolysis techniques will be: hot water treatment, sulphuric acid catalysed hydrolysis and acetic acid catalysed hydrolysis. The obtained monosaccharide sugars can then be used in various applications. For example, a company that produces 50 tons of sawdust per day has expressed interest in the production of xylitol from the extracted xylose monosaccharides. According to the company, in South African markets xylose sells for approximately R20/kg and it has been noted that there has been an increased demand for the product. The aim of this work is to characterise, fractionate and utilise the sawdust obtained from both hardwoods and softwoods to investigate the production of xylitol and possibly other products. The project is defined as a Category 1 project and will incorporate a PhD study.</p>
Lead institution:	CSIR
Partner institutions:	UKZN, DUT. Hans Merensky, York Timber, Afrixyll
Student name	Paul Kekana
Principal Investigator:	Prof. Bruce Sithole
Degree:	PhD
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Start date:	April 2015
End date:	March 2018
Feedstock:	Saw dust
Value chain products:	Sugars
Geographic source of the feedstock:	Across South Africa