

光谱学与光谱分析

Structural Characterization of Lignins Isolated from *Caragana sinica* Using FT-IR and NMR Spectroscopy

XIAO Ling-ping¹, SHI Zheng-jun¹, XU Feng^{1*}, SUN Run-cang^{1,2}, Amar K Mohanty³

1. College of Material Science and Technology, Beijing Forestry University, Beijing 100083, China

2. State Key Laboratory of Pulp and Paper Engineering, South China University of Technology, Guangzhou 510640, China

3. Department of Plant Agriculture, Bioproducts Discovery and Development Centre (BDDC), University of Guelph, Guelph, Ontario N1G 2W1, Canada

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摘要 In order to efficiently explore and use woody biomass, six lignin fractions were isolated from dewaxed *Caragana sinica* via successive extraction with organic solvents and alkaline solutions. The lignin structures were characterized by Fourier transform infrared spectroscopy (FT-IR) and 1D and 2D Nuclear Magnetic Resonance (NMR). FT-IR spectra revealed that the "core" of the lignin structure did not significantly change during the treatment under the conditions given. The results of ¹H and ¹³C NMR demonstrated that the lignin fraction L2, isolated with 70% ethanol containing 1% NaOH, was mainly composed of β-O-4 ether bonds together with G and S units and trace *p*-hydroxyphenyl unit. Based on the 2D HSQC NMR spectrum, the ethanol organosolv lignin fraction L₁, extracted with 70% ethanol, presents a predominance of β-O-4' aryl ether linkages (61% of total side chains), and a low abundance of condensed carbon-carbon linked structures (such as β-β', β-1', and β-5') and a lower S/G ratio. Furthermore, a small percentage (ca. 9%) of the linkage side chain was found to be acylated at the γ-carbon.

关键词 [Caragana sinica](#) [Lignin](#) [Structural characterization](#) [FT-IR](#) [NMR](#)

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通讯作者:

XU Feng xfx315@bjfu.edu.cn

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