

SYNTHESIS OF A STANDARD NECESSARY FOR IDENTIFICATION OF ORGANIC COMPOUNDS PRODUCED DURING LIGNIN DEGRADATION

C. Geib, J. E. Schumaker, A. Artemyeva, A. Kubátová, I. P. Smoliakova

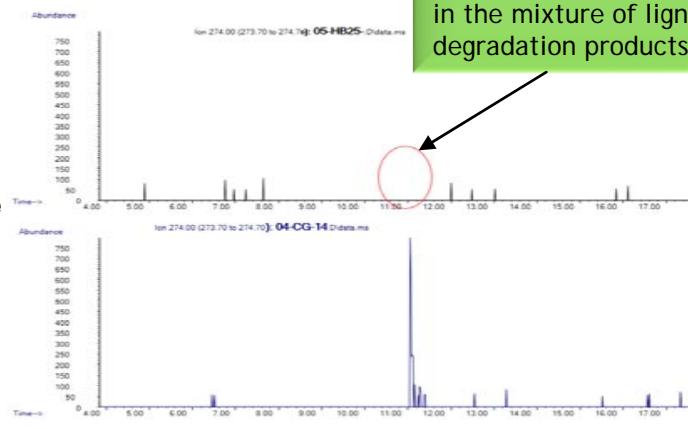
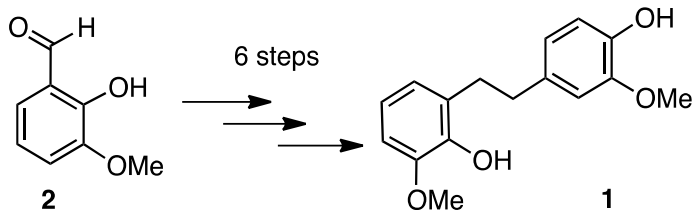
Objectives:

1. To synthesize 4-(2-hydroxy-2-methoxyphenethyl)-2-methoxyphenol (1) from 2-hydroxy-3-methoxybenzaldehyde (2) and other commercially available compounds in six steps in order to use it as an analytical standard for identification of unknown lignin degradation products.
2. To characterize compound 1 and its precursors using ^1H NMR spectroscopy.
3. To determine the chromatography retention time and fragmentation pattern in GCMS for compound 1 and compare these data with those of lignin degradation products.

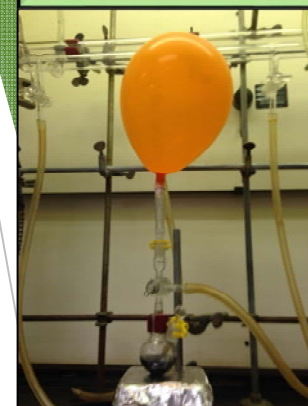
Research Project:

A series of reactions were performed including nucleophilic substitution, reduction, chlorination, phosphination, Wittig coupling, and hydrogenation. The structure of product 1 and its precursors were analyzed by ^1H NMR spectroscopy. GCMS of compound 1 confirmed its molar mass to be 274 amu. Compound 1 was compared to the retention times values of the thermal lignin degradation. It was found that compound 1 is unlikely to form during lignin degradation.

Clayton Geib examining a compound after synthesis.



Hydrogenation apparatus to prepare compound 1.



The lack of compound 1 peak in the spectrum indicated its absence in the mixture of lignin degradation products.

