



# PROCESS ECONOMICS PROGRAM

SRI INTERNATIONAL  
Menlo Park, California  
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## Abstract

Process Economics Program Report No. 147

### CHEMICALS FROM WOOD WASTES AND PULPING RESIDUES

(June 1982)

The technology, economics, industrial uses and market status of a group of chemicals from wood wastes and pulping residues are reviewed. The chemicals and chemical processes examined are as follows:

- Vanillin by alkaline oxidation of lignin from waste sulfite liquor.
- Dimethyl sulfide by demethylation of lignin in kraft black liquor with sulfur under alkaline conditions.
- Dimethyl sulfoxide by the oxidation of dimethyl sulfide with oxygen and nitrogen dioxide catalyst.
- Furfural by acidic hydrolysis and cyclodehydration of pentosans found in wood, corncobs, bagasse, and cereal hulls.
- Phenol and benzene by depolymerization of kraft lignin through hydrocracking and subsequent hydrodealkylation.
- Low Btu gases, charcoal, and pyrolysis oils equivalent to No. 6 grade fuel and diesel oils by wood pyrolysis in an oxygen deficient atmosphere.

These are categorized as synthetic products from wood-derived feedstocks compared to the by-products emerging from the wood pulping process, such as tall oil, turpentine, solidified lignin residues, and residual sugars and their fermentation to ethanol and yeasts. This latter group of products is not reviewed in this report except for the inclusion of schematic flow diagrams for the production of ethanol and methanol from wood for informational purposes.

Report No. 147

**CHEMICALS FROM WOOD WASTES  
AND PULPING RESIDUES**

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**June 1982**

A private report by the  
**PROCESS ECONOMICS PROGRAM**

Menlo Park, California 94025

For detailed marketing data and information, the reader is referred to one of the SRI programs specializing in marketing research. The CHEMICAL ECONOMICS HANDBOOK Program covers most major chemicals and chemical products produced in the United States and the WORLD PETROCHEMICALS Program covers major hydrocarbons and their derivatives on a worldwide basis. In addition, the SRI DIRECTORY OF CHEMICAL PRODUCERS services provide detailed lists of chemical producers by company, product, and plant for the United States and Western Europe.

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