



Environmental Enhancement Through Corn Stover Utilization

Cooperative Research and Development Final Report

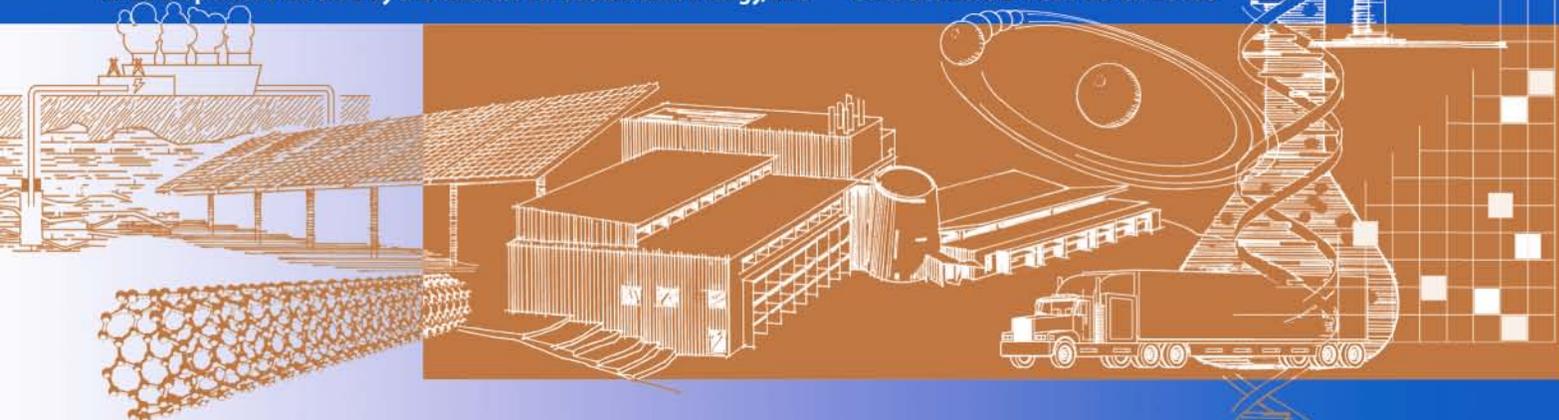
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NREL Technical Contact: Stefan Czernik

CRADA Report
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In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

CRADA number: CRD-06-00174

CRADA Title: Environmental Enhancement Through Corn Stover Utilization

Parties to the Agreement: Iowa State University + NREL

Abstract of CRADA work:

Under this CRADA, the National Renewable Energy Laboratory (“NREL” or “Contractor”) will: 1) evaluate the production of hydrogen from bio-oil produced from corn stover; 2) evaluate the production of hydrogen from the carbohydrate-rich fraction of bio-oil as recovered by Iowa State University’s fractionating condenser; and 3) perform mass and energy balances on the reforming process.

Summary of Research Results:

We have developed a rapid bio-oil analysis protocol based on the application of mass spectrometry, infra-red spectrometry, and multivariate statistical analysis. This protocol was successfully applied to characterize bio-oil samples from the ISU fast pyrolysis unit and to relate those characteristics to the feedstock and the process conditions.

Several samples of bio-oil fractions produced at ISU pilot plant were catalytically processed in the NREL fluidized bed steam reforming system. Mass balances and yields of hydrogen were calculated. It was found that more volatile bio-oil fractions from the ISU condensation system could be effectively used for producing hydrogen while those less volatile, containing higher amounts of oligosaccharides and of lignin-derived material tended to form more coke deposits on the catalyst thus reducing the process activity.

Subject Inventions listing:

None

Report Date: 4/30/10 Responsible Technical Contact at Alliance/NREL: Czernik, Stefan

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