

THESIS INFORMATION

Title: **STUDYING TO TRANSFORM VIETNAMESE BIOMASS INTO BIO-OIL BY FAST PYROLYSIS AND HYDRODEOXYGENATION (HDO) TECHNOLOGIES BASED ON MOLYBDENUM CATALYST**

Major: **Refining and Petrochemical Engineering**

Major code: **62527510**

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The major objectives of this study are to create a scientific basis and advanced technology to transform Vietnamese biomass resources into valuable products, namely:

1. Producing bio-oil from four types of Vietnamese biomass as straw, rice husks, baggase and corn cobs by fast pyrolysis method;
2. Upgrading bio-oil to obtain the valuable products by hydrodeoxygenation process.

The main contributions of the thesis are as follows:

1. Introducing scientific basis and technology to transform four types of Vietnamese agricultural by-products (straw, rice husks, bagasse, corn cobs) into liquid fuels by combining the advanced technologies of fast pyrolysis and hydrodeoxygenation (HDO);
2. Producing successfully the catalyst for HDO reaction based on MoO_x promoting with NiO and Pt on SBA-15 with high effect of model compound and bio-oil produced from straw without sulfurization;
3. Supplementing the scientific basis to clarify the influence of promoting elements such as Ni, Co, Pt and supports on MoO_x catalytic performance, which confirms the role of the promoters to the reduction and dispersion capability of active phase.

4. Contributing to the development of production technology of renewable fuels from agricultural waste and participating in solving issues of national energy security and environmental pollution caused by industrial waste. The study results confirmed that fast pyrolysis and hydrodeoxygenation are feasible advanced technologies in transforming agricultural waste biomass into liquid fuels. The thesis also studies and creates the scientific basis for blending upgraded bio-oil with Bach Ho crude oil as feedstock for RFCC unit of Dung Quat refinery. Initial results open up new research directions in the utilization of bio-oil efficiently and partly replacement the feedstock for refineries.

Advisor

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