**Introduction**


Raw Material: DDGS (Dried Distilled Grain with Solubles), a byproduct in first generation ethanol production.

Process conditions: 240-350 °C and 225-250 bar, in the presence of a heterogeneous (Zirconia) catalyst.

Products: Main components are bio-oil, H2O, CO2, and water-soluble organic compounds.

Capacity: 10-20 L/h of wet biomass pilot plant with fixed-bed reactor.

**Thermodynamic model**

The results were correlated with PSRK model proposed by Holderbaum and Gmehling, which is predictive Soave-Redlich-Kwong EOS with the modified Huron-Vidal first-order (MVF1) mixing rule of Michelsen coupled with the UNIFAC model.

**Aim**

Measurement and Prediction of bubble point pressures of selected model system to investigate phase boundaries of the CatLiq® process.

**Experiment**

The experimental study was carried out in a mercury free JEFRI-DBR high pressure PVT phase behavior system using composition of (7.0% CO2 + 84.8% H2O + 0.1% Ethanol + 0.1% Acetic acid + 8.0% Octanoic acid) as a model system for CatLiq® process.

**Results**

**Conclusion**

Experimental and predicted data shows that the capability of the PSRK model is reasonably good in predicting the phase behaviour of such a model system for CatLiq® process.

This modelling work is useful for the CatLiq® process design, development and optimization, which provides a general thermodynamic approach on how to model biomass conversion processes.

**References**


**Acknowledgement**

The authors would like to thank the SCF Technologies A/S for giving the opportunity to perform this research. Thanks are also due to Tor Austad and Sivert for his help in the experimental work at the Department of Petroleum Engineering, Stavanger University, Norway.