

# Shannon Klaus, Chemical Engineering

Year in School: Junior

Hometown: Liberty, MO

Faculty Mentor: Dr. William Jacoby, Chemical Engineering

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## **Gasification of biomass in supercritical water to produce fuel gas**

Shannon Klaus, Karen Blaha, C. Leemer, & William Jacoby

Several types of biomass, which includes plant and animal wastes, are produced in millions of tons each year, and due to their high carbon and hydrogen content, are great potential energy sources. Biomass is energy that is part of the carbon cycle: it captures carbon dioxide during its creation which is then re-released during its conversion to usable energy, therefore creating reduced carbon dioxide emissions compared to typical fuel sources. The purpose of this project is to find the feasibility of the conversion of biomass into fuel gas by using supercritical water as a reaction medium. Supercritical water is defined as water above its thermodynamic critical point, which is at high temperatures and pressures, and it is ideal since it is a very reactive medium but does not produce emissions during reaction. We studied conversion of rice straw to fuel gas using supercritical water as the reaction medium. A biomass and water mixture is placed above supercritical conditions to achieve conversion of these waste products into potential energy sources. Parameters studied include heating time and initial furnace temperature in order to optimize conditions to obtain maximum fuel gas yield, which is primarily composed of hydrogen and methane. With these conditions for maximum conversion rates, the possibility of a scale-up design of this and similar processes can be determined in the hope to find practical alternate energy sources.