

## **Project Title: On-site Generation of Hydrogen from Ethanol**

### **Principal Investigator:**

Sunggyu Lee

Professor, Department of Chemical and Biological Engineering

University of Missouri-Rolla

143 Schrenk Hall

Rolla, MO 65409-1230

P: 573-341-4416

f: 573-341-4377

e: slee@mizzou.edu

**Student Involvement:** One graduate student

**Project Objective:** The objective is to develop a revolutionary fuel reformation technology that uses supercritical water to convert a variety of liquid hydrocarbon fuels, including ethanol, into hydrogen.

**Project Abstract:** Researchers at the University of Missouri have developed a revolutionary fuel reformation technology that uses supercritical water to convert a variety of liquid hydrocarbon fuels, including ethanol, into hydrogen with excellent conversion efficiency and in an environmentally friendly manner. This process technology overcomes two of the major hurdles in moving to a hydrogen economy: 1) the source of hydrogen; and 2) the storage and distribution of hydrogen. It accomplishes this by allowing for different hydrogen sources and alleviating the issue of storage/distribution by efficiently producing hydrogen on-demand in small to medium quantities. The currently proposed process engineering study targets at process optimization and scale-up design via mini pilot-scale demonstration of process feasibility and effectiveness.

**Anticipated Benefits:** The process technology for on-site generation of hydrogen in small to medium quantities will be developed.

**Modal Orientation:** Hydrogen transportation systems

**Relationship to other Research/Projects:** The proposed project is related to the development of a rural hydrogen transportation test bed that will demonstrate, evaluate and promote hydrogen-based technologies in a real-world environment.

### **Technology Transfer Activities:**

1. Technical reports showing findings, conclusions and recommendations; and
2. Technical papers for publication in conference proceedings and journals.

**Transportation Research Board Keywords:** Hydrogen Generation, Reformation, Supercritical Water